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ltr dtd 29 Apr 1980

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DEPARTMENT OF THE ARMY  
OFFICE OF THE ADJUTANT GENERAL  
WASHINGTON, D.C. 20310

IN REPLY REFER TO

AGAM-P (M) (5 Aug 68) FOR OT RD 682346

21 August 1968

SUBJECT: Operational Report - Lessons Learned, Headquarters, 222d  
Combat Support Aviation Battalion, Period Ending 30 April 1968 (U)

SEE DISTRIBUTION

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2. Information contained in this report is provided to insure that the Army realizes current benefits from lessons learned during recent operations.
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1 Incl  
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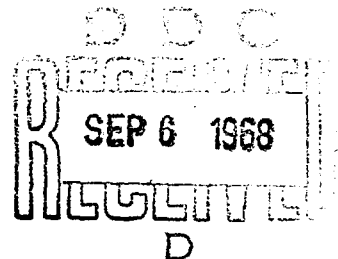
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*Kenneth G. Wickham*

KENNETH G. WICKHAM  
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222d Combat Aviation Battalion

Director, Weapons Systems Evaluation Group

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DEPARTMENT OF THE ARMY  
HEADQUARTERS, 222D COMBAT SUPPORT AVIATION BATTALION  
APO San Francisco 96291

15 May 1968

SUBJECT: Operational Report of the 222d Combat Support Aviation Battalion  
for Period Ending 30 April 1968 RCS CSFOR-65 (R1)

TO: SEE DISTRIBUTION

1. Section 1, Operations: Significant Activities.

a. The mission of the 222d Combat Support Aviation Battalion is:

(1) To provide command, control, staff planning and administrative supervision for assigned units in their mission to provide the III and IV Corps tactical zones with medium and heavy helicopter support.

(2) To be prepared to exercise command and/or operational control of three to seven assault support helicopter companies (Med/Hvy).

(3) To advise the Commanding Officer, 12th Combat Aviation Group, on all matters pertaining to CH-47 and CH-54 helicopters.

b. Since the last report there has been one change to the organizational structure. Personnel of the 2nd Platoon, 478th Assault Support Helicopter Company infused into the 273rd Assault Support Helicopter Company (Hvy) per direction by Headquarters, 1st Aviation Brigade, with an EDCSA of 4 March 1968. The present organization chart and station list is included as Incl 1.

c. The following personnel changes within the command and principal staff group have taken place since the last report:

CO - LTC George W. Adamson, 068855, replaced LTC William L. Denend, 058365, on 22 February 1968.

XO - Major James E. Rogers, 01930337, replaced Major Charles R. Jones, 077060, on 28 February 1968.

S1 - Major Billy J. Patterson, 0401184, no change.

S2 - Major Edward A. Janas, 0F113213, no change.

S3 - Major Larry E. Honsinger, 085185, no change.

FOR OT RD  
682346

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SUBJECT: Operational Report of the 222d Combat Support Aviation Battalion  
for Period Ending 30 April 1968 RCS CSFOR-65 (R1)

S4 - Major Collins J. Purchase, 084505, replaced Captain James P. Hunt, 0103541, on 4 February 1968.

d. Unit strengths as of 30 April 1968:

(1) Military:

| Subordinate<br>Unit | Officer |     | WO   |     | EM   |     | Total |     |
|---------------------|---------|-----|------|-----|------|-----|-------|-----|
|                     | Auth    | O/H | Auth | O/H | Auth | O/H | Auth  | O/H |
| 147th ASHC          | 14      | 11  | 26   | 17  | 215  | 198 | 255   | 226 |
| 205th ASHC          | 14      | 12  | 26   | 12  | 223  | 224 | 263   | 248 |
| 273rd ASHC (Hvy)    | 17      | 10  | 17   | 11  | 156  | 157 | 190   | 178 |
| HHC                 | 16      | 19  | 3    | 3   | 81   | 123 | 100   | 145 |

(2) Civilian:

| Subordinate<br>Unit | DAC  |     | VN   |     | 3rd Nat'l |     | Contractor |
|---------------------|------|-----|------|-----|-----------|-----|------------|
|                     | Auth | O/H | Auth | O/H | Auth      | O/H |            |
| 147th ASHC          | 0    | 0   | 8    | 13  | 0         | 0   | 5          |
| 205th ASHC          | 0    | 0   | 10   | 25  | 0         | 0   | 3          |
| 273rd ASHC          | 0    | 0   | 0    | 7   | 0         | 0   | 3          |
| HHC                 | 0    | 0   | 33   | 23  | 0         | 0   | 0          |

e. Aircraft status as of 30 April 1968 is included as Incl 2.

f. Operational results as of 30 April 1968 is included as Incl 3.

g. The battalion engaged in aviation support operations on each of the 90 days in this reporting period. Missions included aerial resupply, vehicular airlift, medical evacuation, troop lift, artillery air movement and administrative missions.

h. No administrative or tactical movements were made by elements of this Battalion during the quarter.

i. On 3 February 1968 the 273rd ASHC (Hvy) received the mission to off-load 22 - 5 ton G.S. Australian Army trucks from the HMAS Sydney, an Australian Aircraft Carrier anchored in the Vung Tau Harbor. The mission included on-loading 25 sorties of assorted wheeled vehicles and 22 tons of empty Conex containers. In order to airlift the 5 ton G.S. trucks a

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special rigging device had to be fabricated as the Australian trucks do not have standard lifting eyes common to U.S. Army trucks. A rig was fabricated by this unit which consisted of 4 wire ropes looped at one end to form a lifting eye around the front and rear wheel hubs of the trucks. The other end of each of the four wire ropes was attached to a common steel clevis. Two 6 x 6 wooden spreaders attached to the wire rope were used to avoid damage to the trucks. A total of 22 sorties of assorted salvage vehicles ranging from an 18,000 pound prime mover to three 3/4 ton Land Rovers rigged together in a single load, plus 3 sorties of 8 conex containers each, were loaded onto the M145 Sydney. This entire mission was accomplished by one CH-54A in an elapsed time of four hours and thirty four minutes. In this time period 304 tons of cargo were hauled and 1724 ton miles were logged. The feasibility of off-loading from ship to shore by aerial transport was conclusively proven by this mission. Had all loads been optimum, such as containerized cargo, approximately 75 tons of additional cargo could have been hauled in the same elapsed time.

j. At the request of the 1st Australian Task Force, approved by II FFV AAF, a feasibility test in off-loading combat cargo from an Australian LSM by CH-54 was conducted on 11 March 1968. Feasibility test report is included as Incl 4.

k. During the period 17 to 21 March 1968 aircraft from all three aviation units of this Battalion supported the 199th Light Infantry Brigade on an operation in the area from Bien Hoa to Phuoc Vinh. Between three and six aircraft per day were utilized in carrying 373 sorties of artillery, troops, vehicles and supplies.

l. The After-Action Report of a CH-54 Conference sponsored by the 273rd Assault Support Helicopter Company (Hvy) on 23 March 1968, is included as Incl 5.

m. During the period 31 March to 5 April 1968 aircraft from all three aviation units of this Battalion supported the 199th Light Infantry Brigade on an operation in an area South and East of Tay Ninh. Between three and six aircraft per day were utilized in carrying 278 sorties of artillery, troops, vehicles and supplies.

n. At Dong Tam AAF, on 8 April 1968, the 273rd ASHC (Hvy) undertook the mission of testing the feasibility of lifting the M102, 105mm Howitzer bolted to the Airmobile Firing Platform, and containing the weapon's basic load of ammunition. The common method of airlifting this package had been to split it into two loads for movement by CH-47 aircraft. The entire package was rigged for a single point operation with straps projecting from each of the four corners of the Airmobile Firing Platform, joined together with a steel clevis for hook-up to the aircraft. The entire package weighed 15,000 pounds, was found to be an excellent load, and was extremely stable in flight at 70 knots. Airlifting this package in one sortie gives the artilleryman a decided advantage in the deliverance

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for Period Ending 30 April 1968 RCS CSFOR-65 (R1)

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of an immediately useable Mobile Fire Support Base.

p. During the period 16 - 26 April 1968 aircraft from all three aviation units of this Battalion supported the 11th Armored Cavalry Regiment on an operation in an area Southeast of Song Be. Between three and nine aircraft per day were utilized in carrying 1156 sorties of artillery, troops, vehicles and supplies.

q. Throughout the months of February and March, personnel of the Battalion contributed a total of \$44,500 VN to the TET Aggression Relief Project (TARP). This money was delivered to the Phuoc Tuy Province Chief for distribution to needy families in the villages of Baria and Long Dien. In addition, members of this unit have worked continuously on a project to rebuild houses for many families in the village of Baria, who were left homeless after the destruction of the TET offensive. Units of the Battalion continue to support a progressive and realistic Civic Action Program, and have an especially effective liaison with the CORDS agency in the Vung Tau Special Zone.

2. Section 2, Lessons Learned: Commander's Observations, Evaluations and Recommendations.

a. Personnel

(1) "Operation Fix"

(a) OBSERVATION. A program entitled "Operation Fix" was initiated during the period, which returned personnel to RVN for a 90 day TDY, who had just completed a normal tour of duty in country.

(b) EVALUATION. Within this unit, many of these personnel endured extreme personal hardships which negated their usefulness. On the other hand, junior enlisted men applied themselves enthusiastically and contributed materially to the accomplishment of the unit mission.

(c) RECOMMENDATION. That personnel be carefully screened as to suitability, and possible personal reaction, in any future TDY requirements.

(2) Personnel for installation details

(a) OBSERVATION. Units of this Battalion are required to provide as much as 10% of their authorized strength for purposes of installation perimeter defense and daily installation details.

(b) EVALUATION. The great majority of assigned personnel possess hard skill MOS's, and the commander has no alternative but to assign such personnel to these details. The morale of the men is adversely affected because many desire to return to work in their particular specialty. The

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necessity for such installation details is obvious, but the advisability of accomplishing them with personnel from units engaged in daily combat operations is suspect. In addition, units of this Battalion are at times operating at austere manning levels in the area of critical skill aircraft maintenance MOS's.

(c) RECOMMENDATION. It is recommended that specialized TD units be formed to provide installation defense and administrative details. This would assure that aviation units, already operating at austere manning levels, could be free to perform their assigned mission.

b. Operations

(1) Sling loading cargo - filled conex containers by CH-54A

(a) OBSERVATION. Single point suspension of conex containers has proved to be an extremely difficult load due to the poor aerodynamic quality of the conex itself.

(b) EVALUATION. Aircraft are normally forced to fly at airspeeds of 60 knots or less to maintain load stability. A rigging system was devised whereby two conex containers could be rigged together and attached to the aircraft's four-point suspension system. This was done by placing two conex containers back-to-back and securing them together with four chains at the top and bottom corners to form a single unit. The aircraft's four point suspension system could then be hooked through steel clevises at the top four corners of the connected containers.

(c) RECOMMENDATION. All units anticipating use of CH-54A aircraft support consider the use of conex containers rigged in the manner described above. This allows for loads to be flown at airspeeds of 90 knots, in instrument conditions, and with useable payloads of 12,000 pounds.

(2) Rigging CH-47 aircraft for recovery by CH-54

(a) OBSERVATION. The weight and bulk of the CH-47 aircraft does not make for an aerodynamically efficient sling load for the CH-54.

(b) EVALUATION. The basic weight of the CH-47 must be reduced by removing the rotor blades, forward and aft transmissions, and both engines. (These items can then be hauled by another CH-47). A drag parachute is necessary to keep the sling-loaded CH-47 streamlined. The best assembly is a 16 foot drag chute on approximately 40 feet of line with a chute swivel located midway between the CH-47 and the chute. The streamlining effect this size chute produces, enables the CH-54 to attain airspeeds in excess of 70 knots and thereby gives sufficient recovery range.

(c) RECOMMENDATION. That all units involved with recovery of CH-47 aircraft be made aware of the techniques outlined above.



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(3) Proper Utilization of CH-47 Helicopter

(a) OBSERVATION. CH-47 units of this Battalion have maintained records of discrepancies encountered during mission support in order to furnish factual data on the misutilization of the aircraft.

(b) EVALUATION. The type of discrepancies noted include the following: No initial contact with supported unit; supported unit not ready at scheduled report time; number of sorties to be flown not the same as scheduled; loads too heavy or too light; type or composition of load changed without prior notification thru aviation channels; airfield to airfield loads; incorrect call signs and/or frequencies; PZ and/or LZ coordinates not correct; sling equipment inadequate. In an effort to decrease the incident rate of such happenings, units of this Battalion have developed mobile training teams consisting of qualified officer and enlisted aviation personnel, as well as pathfinders, who conduct classes for ground units that receive habitual support. Subjects covered include proper utilization of the CH-47, capabilities and limitations of the aircraft, inspection of sling equipment, proper rigging of type sling loads, and load hook-up procedures.

(c) RECOMMENDATION. That sufficient instruction be instituted in the Army's formal schools program so that all officers and the majority of NCO's will have knowledge of operations with medium and heavy helicopters, prior to serving their tour of duty in RVN.

(4) Dropped Loads

(a) OBSERVATION. Steel planking has a tendency to cut through the rope nets commonly used to haul cargo with the CH-47 helicopter..

(b) EVALUATION. Numerous attempts to devise methods of transporting steel planking in rope cargo nets have all met with unsatisfactory results. The shifting movement of the load being transported often cuts through the net causing the steel planking to fall, thus creating an extreme safety hazard.

(c) RECOMMENDATION. Supported units should be cautioned of the inherent danger of transporting steel planking in rope cargo nets. If possible, a suitable method of transporting steel planking should be devised, and provided to ground units.

(5) Symposiums/Conferences.

(a) OBSERVATION. The use of symposiums and conferences at Battalion level has proved to be a valuable management tool.

(b) EVALUATION. Discussion of subjects and problems pertinent

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for Period Ending 30 April 1968 RCS CSFOR-65 (R1)

to medium and heavy lift helicopter companies has generated a lively exchange of ideas, has enhanced the spirit of cooperation among the assault support helicopter companies in the III Corps area, and has served to stop many potential problems before they had a chance to get started.

(c) RECOMMENDATION. That all aviation battalions in RVN be made aware of the value of such gatherings as a management tool used in accomplishing the unit's mission.

c. Training. None

d. Intelligence.

Rumors

(1) OBSERVATION. During periods of increased enemy activity, rumors have a tendency to become rampant.

(2) EVALUATION. The effect of rumors spreading in the Vung Tau area during the 1968 TET offensive caused intelligence agencies grave consternation, in that rumors had to be investigated, no matter how remote. As a result, these agencies lost valuable time and effort in such investigations. In addition, rumors of impending attacks detracted from assigned missions by disrupting normal activities.

(3) RECOMMENDATION. That all personnel in key positions be reminded through command channels, of their responsibility for suppression of unfounded rumors. Incoming personnel to the USARV command should be briefed on the effects of rumors as a matter of policy, stressing the responsibility of officers and NCO's to suppress rumors.

e. Logistics.

(1) Cargo slings and nets.

(a) OBSERVATION. Slings and cargo nets are in short supply throughout Vietnam.

(b) EVALUATION. The short supply required many loads to be hauled internally, thereby causing excessive ground time between sorties. The amount of time thus wasted cannot be afforded when considered alongside the number of flight hours logged per month. The results are usually that the aviation unit must commit additional aircraft, or the aircraft already committed must fly during the hours of darkness when visibility and flight conditions depreciate.

(c) RECOMMENDATION. That action be taken to procure sufficient slings and nets, and to replace them as they become unserviceable.

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for Period Ending 30 April 1968 RCS CSFOR-65 (R1)

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The supported ground units throughout RVN should have sufficient quantities to accommodate the many tons of cargo they must move every day.

(2) Aircrewman equipment.

(a) OBSERVATION. Assets of aviator sun glasses, body armor, ballistic helmets APM-6, and flight gloves are insufficient to meet total requirements.

(b) EVALUATION. Non-availability of such equipment makes flying in a combat environment even more hazardous than it is inherently.

(3) CH-54 Pressure Refueling Points.

(a) OBSERVATION. The lack of pressure refueling points in the III & IV Corps area is causing a serious handicap of CH-54 operations.

(b) EVALUATION. Without single point pressure refueling nozzles (FSN 4730-289-0096), the CH-54 is required to shut down for each refueling which requires a minimum of 20-30 minutes. With single point pressure refueling nozzles, a maximum of 6-8 minutes is required for refueling. There are many benefits to be gained from using this procedure, namely; safety features, time saved for mission accomplishment, and elimination of repeated shut downs.

(c) RECOMMENDATIONS: Recommend that all units responsible for mini-port operation requisition and install one pressure refueling point at each mini-port in the III and IV Corps area. Due to the size of the CH-54, and the amount of rotor wash it generates, recommend that areas of suitable size be established to accommodate the CH-54 without disrupting operations of UH-1 helicopters.

f. Organization. None

g. Civic Action.

Civic Action Projects

(1) OBSERVATION. There is a tendency to consider a civic action project as the building of a school, a lamet, a road, or some similar activity.

(2) EVALUATION. The best civic action project is one that is received and executed enthusiastically. Experience has shown that a short-range project such as a collection of funds or building framework for a house, are received enthusiastically. The results are obvious, and readily visible, which appeals to the soldier that will rotate to CONUS prior to the completion

!! SUBJECT: Operational Report of the 222d Combat Support Aviation Battalion  
for Period Ending 30 April 1968 RCS CSFOR-65 (R1)

of a large, complicated project. Aviation units, as well as other units engaged directly in combat operations, perform duty 24 hours a day, which does not provide a substantial amount of volunteers on a prolonged basis. Conversely, a well-coordinated, short-range project produces sufficient volunteers to accomplish the task.

(3) RECOMMENDATION. That CORDS officials and other agencies involved in the civic action program, should consider projects that can be completed in one or two days, for assignment to units engaged in daily combat activities.

h. Safety.

(1) CH-47 Cargo hook failure

(a) OBSERVATION. Loss of sling loads in flight due to material failure of CH-47 cargo hook has occurred.

(b) EVALUATION. A 155mm Howitzer was dropped from 2,500 feet because of a suspected failure of the carriage assembly bolt in the CH-47A cargo hook. The entire cargo hook separated from the beam track assembly. The total weight of the sling load was 12,000 lbs. The cargo hook has a capacity of 16,000 lbs. No inspection criteria or strength test is performed on any component of the CH-47 cargo hook at this time.

(c) RECOMMENDATION. An inspection be required on the carriage assembly bolts at a specified time, and a strength test be performed on the cargo hook at a specified time to insure a 16,000 lb. capacity.

(2) CH-47 Cargo hook release

(a) OBSERVATION. Failure of the CH-47 cargo hook to release a load after the load touches the ground with forward movement of the aircraft, has led to aircraft accidents.

(b) EVALUATION. On two different occasions engine failure occurred at low altitude, (one at 200 feet, one at a hover) with a sling load. The load failed to release from the hook after the load was on the ground, due to the fact that the hook does not trip far enough to the rear to allow the sling load to fall free. On both occasions, forward movement of the aircraft and aft drag of the load on the ground failed to allow external load to release.

(c) RECOMMENDATION. The cargo hook be redesigned to allow the load to be released under all emergency conditions, perhaps by turning the hook 180 degrees to preclude an external load from hanging up on an open hook.

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1. Medical.

Availability of medication peculiar to a tropic climate.

(1) OBSERVATION. Medication to fight tropical skin discomforts is in critically short supply.

(2) EVALUATION. In the hot, humid environment of Vietnam, where fungus infectious and skin eruption are experienced so frequently, it is necessary that an adequate supply of such medications as Tinactin, Verdefam, and Mycolog ointment be made available.

*George W Adamson*

GEORGE W. ADAMSON  
LTC, Infantry  
Commanding

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- 4 - CO, 12th CAG
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AVOC-80 (15 May 68) 1st Ind  
 SUBJECT: Operational Report of Headquarters, 22nd Combat Support  
 Aviation Battalion for Period Ending 30 April 1968 RGS  
 OUPOR - 65 (RI)

DA, HEADQUARTERS, 12th COMBAT AVIATION GROUP, APO 96266 22 May 1968

TO: Commanding General, II FFORCEV, APO 96266

1. In compliance with AR 525-15 and USARV Regulation 525-15, one copy of subject report is forwarded.

2. This headquarters has reviewed subject report and the following comments are made:

a. Reference, page 6, para 2b(3): The misutilization of aviation assets, particularly medium and heavy helicopters, is a recurring problem as key personnel in supported units rotate from RVN. Although the use of the Mobile Training Team alleviates this problem somewhat, sufficient instruction at service schools would be beneficial.

b. Reference, page 6, para 2b(4): Dropped external sling loads, due to improper rigging and unservicable sling equipment, continues to be a problem. Commanders at all levels must continue to emphasize the proper maintenance of sling equipment and use of proper rigging techniques.

c. Reference, page 8, para 2e(2): Flight gloves, sun glasses, body armor, and ballistic helmets have been placed under command control to insure equitable distribution, due to limited assets.

A recent check with the 14th Inventory Control Center revealed that there are limited quantities of leather flight gloves available for issue. Units must comply with LC Regulation 725-4 when requisitioning this item and sunglasses. Ballistic helmets and body armor are controlled by USARV with priority being given to those units who arrived in-country without any of these items.

d. Reference, page 8, para 2e(3): Action has been taken by C-4, II FFV, and S-4, 1st Avn Bde to provide single pressure point refueling nozzles at refueling points.

FOR THE COMMANDER:

*James E. Lybrand*  
 JAMES E. LYBRAND  
 Major, Infantry  
 Asst Adjutant

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AVFBC-RE-H (15 May 68) 2nd Ind  
SUBJECT: Operational Report of the 222d Combat Support Aviation Battalion  
for Period Ending 30 April 1968 RCS CSFOR-65 (R1)

DA, HQ II FFORCEV, APO San Francisco 96266 12 JUN 1968

THRU: Commanding General, 1st Aviation Brigade, ATTN: AVBA-C, APO 96307

Commanding General, US Army Vietnam, ATTN: AVHGC(DST), APO 96375

Commander, US Army Pacific, ATTN: GPOP-OT, APO 96558

TO: Assistant Chief of Staff for Force Development, Department of the  
Army, Washington, D.C. 20310

1. Subject report is forwarded.

2. This command has reviewed the attached Operational Report - Lessons Learned of the 222d Combat Support Aviation Battalion and concurs with it with the exception of para 2a(2). Each unit and each soldier has the responsibility to contribute to area defense and to necessary administrative details. Installation commanders, however, should understand that there may be occasions when units need to be relieved of such details for short periods to insure the accomplishment of the combat mission.

FOR THE COMMANDER:

OB Fory  
O. B. FORY  
1LT, AGC  
Asst AG

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AVBA-C (15 May 68) 3d Ind  
SUBJECT: Operational Report of the 222d Combat Support Aviation Battalion  
for Period Ending 30 April 1968 RGS CSFOR-65 (R1) (U)

DA, HEADQUARTERS, 1ST AVIATION BRIGADE, AFO 96384 JUN 25 1968

THRU: Commanding General, United States Army Vietnam, ATTN: AVHGC-DST,  
AFO 96375  
Commander in Chief, United States Army Pacific, ATTN: GPOF-CT,  
AFO 96558

TO: Assistant Chief of Staff for Force Development, Department of the  
Army, Washington, D.C. 20310

1. This headquarters has reviewed this report, considers it to be adequate, and concurs with the contents as indorsed.

2. The following additional comments are considered pertinent:

a. Paragraph 2a(2), page 4. Although units formed to provide installation defense would enable aviation units to more efficiently perform their assigned mission, space limitations do not allow for the manning of TD units.

b. Paragraph 2e(1), page 7. 12 X 12 foot nylon nets are being distributed by S-4, 1st Aviation Brigade. Basis for issue is 1 per CM-47. USARV has directed the 1st Aviation Brigade to determine the sling requirements for FY 69.

c. Paragraph 2a(2), page 8. Aircrewman equipment is in short supply, however, these items are controlled by USARV. Ballistic helmets should be available for issue by the end of June 1968.

d. Paragraph 2e(3)(b), page 8. The Logistic Command and the Inventory Control Center can not identify the stock number given. The Supply Officer, 1st Aviation Brigade is attempting to locate these nozzles.

e. Paragraph 2i, page 10. The country-wide shortage of these medications is recognized. A large shipment of Tinactin should arrive at the 32d Medical Depot during June 1968 for distribution and should alleviate the problem.

FOR THE COMMANDER:

  
J. D. SEGAL  
1LT, AGC  
ASST ADJUTANT GENERAL



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AVHGC-DST (15 May 68) 4th Ind (C) CPT Arnold/ms/LBN 4485  
SUBJECT: Operational Report of the 222d Combat Support Aviation  
Battalion for Period Ending 30 April 1968 RCS CSFOR-65 (R1)

HEADQUARTERS, US ARMY VIETNAM, APO San Francisco 96375 6 JUL 1968

TO: Commander in Chief, United States Army, Pacific, ATTN: GI-OP-VT,  
APO 96558

1. (U) This headquarters has reviewed the Operational Report-Lessons Learned for the quarterly period ending 30 April 1968 from Headquarters, 222d Combat Support Aviation Battalion.

2. (C) Comments follow:

a. Reference item concerning "Operation Fix", page 4, paragraph 2a(1): Nonconcur. This headquarters recognizes individual inconveniences and inequities which result when the Army sustaining base, already strained to provide hard-skill MOS personnel against RVN authorizations, is required to provide additional personnel on a TDY basis. The Army personnel system provides means to relieve legitimate hardship cases, extreme or otherwise, by compassionate reassignment or discharge. Productive utilization of personnel assigned or attached to a unit is a function of command.

b. Reference item concerning civic action projects, page 8, paragraph 2g: Concur. Short-term high-impact civic action projects are most desirable and best suited for combat units. While construction projects, MEDCAPS, and public works projects are desirable, commodity distribution, providing classroom teaching kits, orphanage support, and similar individual assistance projects also play an important role in the USARV civic action effort. Donor Deposit Funds collected by units as outlined by USARV Regulation 230-6 may be donated to worthy institutions, but may best be used to purchase needed commodities or materials. All projects should be of a self-help nature.

c. Reference item concerning CH-47 cargo hook failure, page 9, paragraph 2h(1): Concur. Recommend that unit continue their active participation in the EIR program and submit an EIR requesting inspection criteria be established for the CH-47 cargo hook and carriage assembly bolts.

d. Reference item concerning CH-47 cargo hook release, page 9, paragraph 2h(2): Concur. Recommend the unit submit an EIR requesting a study be made on the possibility of turning the cargo hook 180°

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CONFIDENTIAL

**CONFIDENTIAL**

AVHGC-DST (15 May 68) 4th Ind (C)

SUBJECT: Operational Report of the 222d Combat Support Aviation  
Battalion for Period Ending 30 April 1968 RCS CSFOR-65 (R1)

or designing it to open wider which will preclude the cargo sling  
from hanging up when released. USARV has discussed this problem with  
Boeing-Vertol Technical Representative who stated he will contact the  
factory for a possible answer/solution to this problem.

FOR THE COMMANDER:

*C. S. Nakatsukase*  
C. S. NAKATSUKASE  
Captain, AGC  
Assistant Adjutant General

Copies furnished:  
HQ, 222d Cbt Sup Avn Bn  
HQ, 1st Avn Bde

**CONFIDENTIAL**

GPOP-DT (15 May 68) 5th Ind (U)

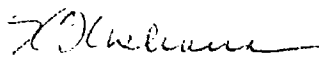
SUBJECT: Operational Report of HQ, 222d Cbt Spt Avn Bn for Period  
Ending 30 April 1968, RCS CSFOR-65 (R1)

HQ, US Army, Pacific, APO San Francisco 96558 19 JUL 1968

TO: Assistant Chief of Staff for Force Development, Department of the  
Army, Washington, D. C. 20310

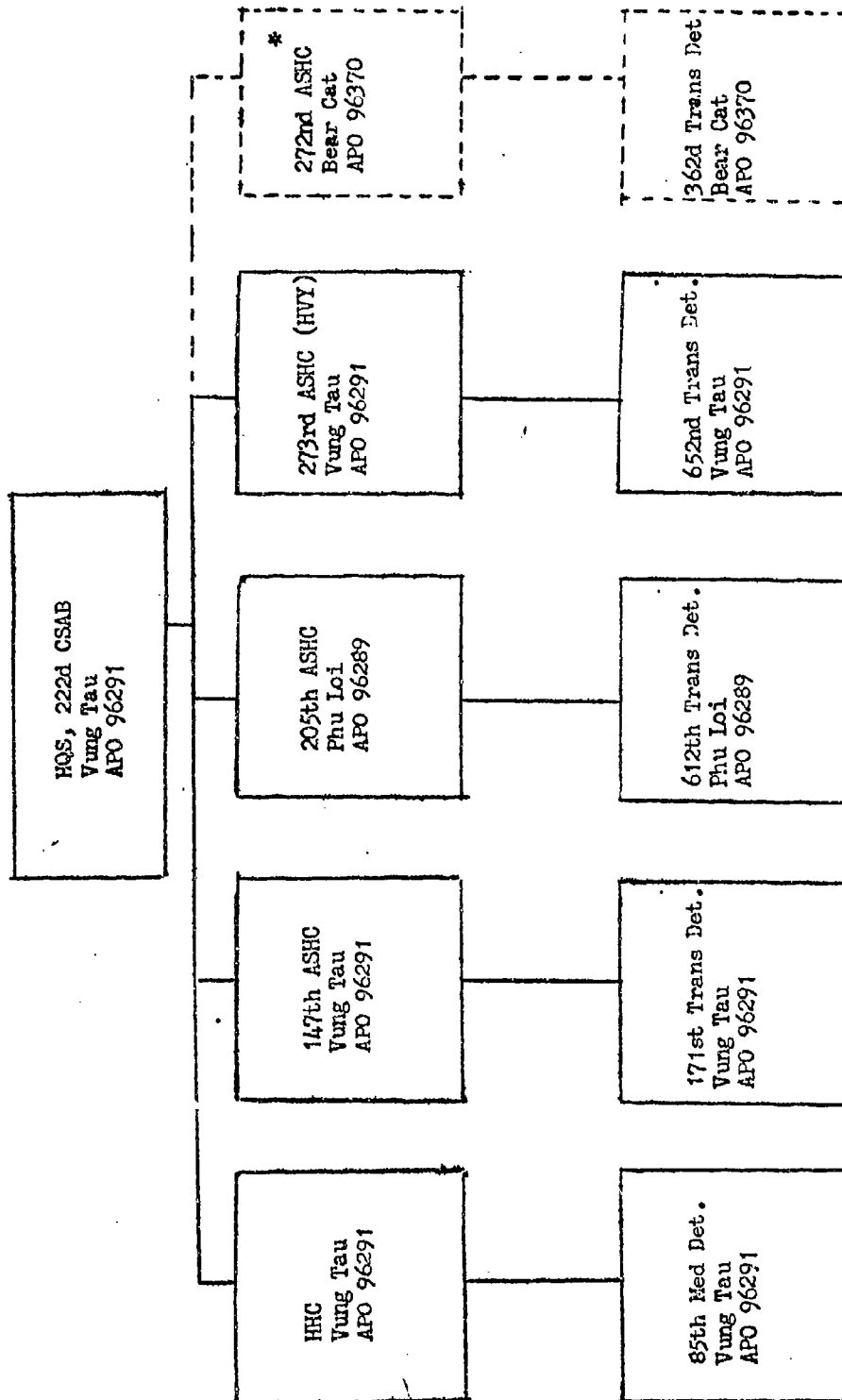
This headquarters has evaluated subject report and forwarding indorse-  
ments and concurs in the report as indorsed.

FOR THE COMMANDER IN CHIEF:

  
K. F. OSBOURN  
MAJ, AGC  
Asst AG

222d CSAB, Organization Chart and Station List  
Quarter Ending 30 April 1968

Incl 1



\*To arrive in-country on 20 May 1968.

222d CSAB Aircraft Status  
Quarter Ending 30 April 1968

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| Subordinate<br>Unit | OH-23 |     | UH-1D |     | U-6  |     | CH-47 |     | CH-54 |     |
|---------------------|-------|-----|-------|-----|------|-----|-------|-----|-------|-----|
|                     | Auth  | O/H | Auth  | O/H | Auth | O/H | Auth  | O/H | Auth  | O/H |
| 147th ASHC          |       |     |       |     |      |     | 16    | 15  |       |     |
| 205th ASHC          |       |     |       |     |      |     | 16    | 16  |       |     |
| 273rd ASHC (Hvy)    |       |     |       |     |      |     |       |     | 9     | 6   |
| HQS                 | 3     | 0   | 0     | 2   | 0    | 1   |       |     |       |     |
| 222d CSAB           | 3     | 0   | 0     | 2   | 0    | 1   | 32    | 31  | 9     | 6   |

Incl 2

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222d CSAB Operational Statistics  
Quarter Ending 30 April 1968

Incl 3

| Subordinate Unit | Sorties Flown | Troops Lifted | Cargo Tons Lifted | Enemy KIA | Structures Dam Dest | Sampans Dam Dest | *Aircraft Confirmed Loss | *Aircraft Damaged |
|------------------|---------------|---------------|-------------------|-----------|---------------------|------------------|--------------------------|-------------------|
| 147th ASHC       | 9,749         | 33,665        | 13,874            | 0         | 0                   | 0                | 1                        | 17                |
| 205th ASHC       | 10,983        | 32,861        | 16,179            | 0         | 0                   | 0                | 0                        | 15                |
| 273rd ASHC       | 2,380         | 0             | 7,918             | 0         | 0                   | 0                | 0                        | 7                 |
| 222d CSAB        | 23,112        | 66,526        | 37,971            | 0         | 0                   | 0                | 1                        | 39                |

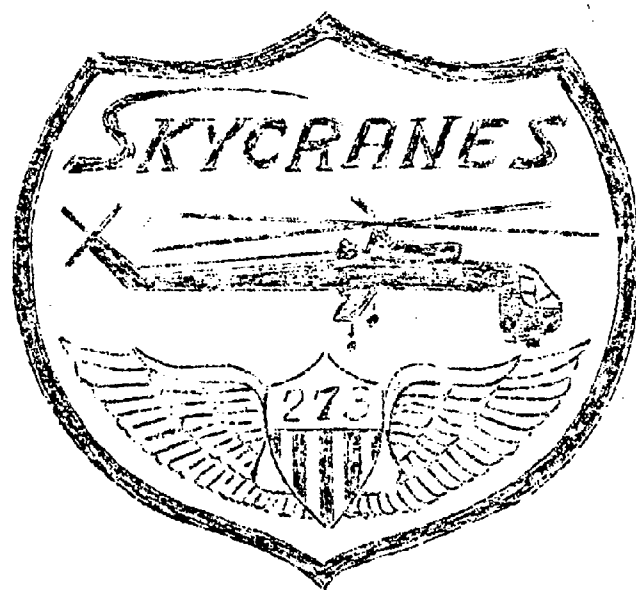
\* Loss & Damage Reported by type

147th ASHC Aircraft Loss: 1 CH-47; Aircraft Damage: 17 CH-47  
 205th ASHC Aircraft Damage: 15 CH-47  
 273rd ASHC (Hvy) Aircraft Damage: 7 CH-54

CH 54H (SKYCRANE)

21

# OPERATIONS



273<sup>RD</sup> ASSAULT  
SUPPORT  
HELICOPTER  
COMPANY

Incl 4 (HEAVY HELICOPTER)

23

DEPARTMENT OF THE ARMY  
273D ASSAULT SUPPORT HELICOPTER COMPANY (HVV)  
APO San Francisco 96291

1 March 1968

SUBJECT: Introduction to CH-54 (Skycrane) Operations

TO: See Distribution

1. Purpose. The purpose of this letter is to familiarize using units with the operational capabilities of the CH-54 (Skycrane) helicopter and to outline items necessary to consider when employing this aircraft.

2. General. The CH-54 (Skycrane) helicopter is a twin turbine heavy lift helicopter. Its maximum gross weight is 42,000 lbs. The following data is provided for information:

a. Overall dimensions: Length (main rotor tip to tail rotor tip) 88 feet 5 inches.

b. Height: Top of tail rotor 25 feet 5 inches.

c. Main rotor diameter: 72 feet.

d. Fuel:

(1) JP-4 (alt JP-5)

(2) Consumption: Maximum gross weight 3600-4000 lbs per hour.  
Without load 3200 lbs per hour.

e. Endurance:

(1) All tanks full 2 hours 15 minutes.

(2) Main tanks only 1 hour 20 minutes.

(3) Normal operations use main tanks only.

f. Airspeed:

(1) Without a load - sea level to 2000 feet, 115 knots.

(2) At maximum allowable gross weight sea level to 2000 feet, maximum 95 knots. Average cruise at gross weight, 80 knots.

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SUBJECT: Introduction to CH-54 (Skycrane) Operations

1 March 1968

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g. Capabilities:

(1) Cargo capacity to 18,000 lbs external loading with reduced fuel and range.

(2) Normal operations, 14,000-16,000 lbs load.

(3) Level flight and landing capability with one engine at maximum gross weight.

h. Instrument flight: May be performed, but is not recommended with external loads.

3. Type Missions Performed: The full potential of mission capability is limited only by the ingenuity of those involved in the planning phase. Typical missions are:

a. Lift of equipment weighing between 8,000 and 18,000 lbs.

(1) Engineer equipment: Any piece of equipment which does not exceed the weight limitations and distances described in paragraph 4, below and which lends itself to sling or 4 point hook-up, may be transported. Equipment weighing more than 18,000 lbs may be moved by disassembly and reassembly at destination.

(2) Artillery Battery (155mm): These may be lifted intact with section equipment tied securely onto the trails. The equipment must be secured so as not to drop off in flight. Total weight of 155mm howitzer plus equipment should be approximately 14,000-15,000 lbs.

b. Ammunition: Can be loaded in A-22 bins, cargo nets, or rigged on pallets.

c. FOL in collapsible bladders: This load should be rigged in groups of four 500 gal bladders each for normal operations, although five bladders may be transported over a reduced distance. The bladders should be rigged with three bladders hanging vertically and one or two (as appropriate) riding horizontally at the front of the load.

d. Aircraft recovery: Aircraft weighing less than 18,000 lbs may be recovered subject to the radius of action limitations described in paragraph 4, below. The 100 foot hoist cable gives the CH-54 the capability of recovering downed aircraft from areas with limited accessibility.

e. Discharge of cargo from vessels anchored in the stream. The CH-54 can discharge entire vessels or can selectively remove high priority cargo for delivery to inland locations.

f. Lifting of pre-positioned bridge sections. The CH-54 can position bridge sections as long as 55 feet thereby quickly removing obstacles to ground movement.

1 March 1968

g. The CH-54 has the capability of emplacing loads very exactly, which is particularly advantageous in placement of towers and other equipment which requires a precise landing on a prepared base or restricted location.

h. External loading is accomplished by one of two methods, single point suspension and four point suspension.

(1) Single Point Suspension - The normal means of external loading. Gives full advantage to the cable and winch assembly which may be used to extract loads from inaccessible areas. It provides the quickest hook-up procedures and is generally used when transporting bulky loads. The weight and configuration of the load may dictate slower airspeeds than originally planned. A light load (less than 8,000 lbs) may in fact be dangerous to carry single point. On-the-spot decisions by the aircraft commander must be made regarding each light load.

(2) Four Point Suspension: The four point suspension system may be used to lift loads which lend themselves to 4 point hook-up. (Trucks, Coraxes, and some engineer equipment which have lifting eyes installed.) Using the four point system usually eliminates the need for rigging. Disadvantages of using the 4 point suspension system instead of the single point sling are:

(a) The CH-54 must be able to land at pick-up and drop-off sites.

(b) An average of 5 minutes time is necessary to make a four point hook-up or release.

(c) The jettison capability during flight does not have an emergency back-up system.

i. Special purpose module - Pod: Personnel or cargo may be carried in the pod. Limitations to utilizing this system are:

(1) The pod is presently restricted from passenger use except in tactical emergency.

(2) Weights as opposed to radii described in paragraph 4, below, are reduced by the weight of the pod which is 3,500 lbs.

(3) The attachment or detachment of the pod to the helicopter requires approximately 30 minutes and must be accomplished on level ground.

(4) The 12 inch ground clearance of the pod when on the ground or attached to the helicopter make utilization in rough areas impractical.

(5) There are seats for 67 passengers in the special purpose module.

1 March 1968

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SUBJECT: Introduction to CH-54 (Skycrane) Operations

4. Radius of mission from fuel source: The following can be used as a guide in determining mission feasibility. Whenever there is a doubt whether or not the mission can be accomplished - CALL US.

a. Loads weighing over 14,000 lbs but less than 18,000 lbs require special planning. (Winds, weight, extra equipment aboard aircraft may have to be removed, etc.)

b. Loads 17,000 lbs and under where fuel is available at drop-off site:

| <u>WEIGHT OF LOAD</u> | <u>DISTANCE TO D/O (No-wind condition)</u> |
|-----------------------|--|
| 17,000 lbs            | 21 N M                                     |
| 16,000 lbs            | 38 N M                                     |
| 15,000 lbs            | 55 N M                                     |
| 14,000 lbs            | 73 N M                                     |

c. Loads 17,000 lbs and under where fuel must be obtained by returning to P/U site:

| <u>WEIGHT OF LOAD</u> | <u>DISTANCE TO D/O (No wind condition)</u> |
|-----------------------|--|
| 17,000 lbs            | 13 N M                                     |
| 16,000 lbs            | 25 N M                                     |
| 15,000 lbs            | 35 N M                                     |
| 14,000 lbs            | 48 N M                                     |

d. Odd shape loads which may limit airspeed below 60 knots must have radius of action determined by special planning. An example of this would be a Chinook rigged with drogue chute.

5. Rigging - Responsibility of unit being supported.

a. Rigging of loads must be accomplished prior to the CH-54's arrival. The CH-54 has no cockpit room for passengers or rigging materials.

b. Rigging of loads should be in accordance with applicable technical manuals for items of equipment being rigged.

c. It is imperative that proper strength and serviceable rigging materials be used.

d. Considerations peculiar to the CH-54 are:

1 March 1968

SUBJECT: Introduction to CH-54 (Skycrane) Operations

(1) Rigging straps should be as short as possible commensurate with the proper rigging techniques. (Short straps provide for low hover and therefore more effective power utilization of the helicopter.)

(2) Two hook-up men must be available to hook each load. One man must catch the hook while the other inserts the clevis.

(3) The only acceptable hook-up devices are:

(a) One large steel clevis with "U" down, FSN 1670-090-5354.

(b) Sling, endless, nylon, 40,000 lbs, FSN 1670-902-3080.

(4) Under no circumstances should two 10,000 lb donuts be used. Two donuts side by side in the hook may cause the hook to malfunction.

e. Hook-up personnel should wear goggles or a protective mask and leather work gloves.

f. On missions where the helicopter must hover to emplace a piece of equipment, sufficient personnel should be available to manhandle the equipment into position. (Normally at least 8 men.)

g. Static electricity: The CH-54 hook accumulates a small static electricity charge. Although it is uncomfortable, it will not hurt ground personnel. However, it is considered to be a fire hazard when hauling fuel drums and a static probe should be used to ground the hook before pick-up. Fabrication and use of the static probe may be accomplished as follows:

(1) A static probe may be fabricated from two ammunition box rods, or suitable substitutes, connected by approximately twenty-five feet of insulated wire or cable. One rod must be firmly grounded. The other rod, with an insulated handle to protect the ground handler, is used to contact the hovering helicopter to discharge electricity generated.

(2) Contact the aircraft with the probe as high above the load as possible. In the case of fuel bags, it is conceivable that a static spark could ignite the fuel if contact with the hook were made too close to a leaky roll-on.

6. Fire Support: The CH-54 has no armament to suppress enemy ground fire and therefore requires gunship support on missions where enemy fire is anticipated. Passive measures of defense are employed as a matter of course. Normally missions which originate and terminate in secure airfields are flown without gunship escort, unless weather conditions require low flight over "hot" areas.

7. Weather: Normal helicopter weather operating limitations are applicable. In addition, due to the inherent instability of the single point

1 March 1968

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SUBJECT: Introduction to CH-54 (Skycrane) Operations

cargo system and the lack of suitable sling load display instruments, it is not presently recommended to fly sling loads under instrument conditions.

8. Coordination: When possible, using units should coordinate directly with the supporting unit either by personal liaison or by telephone. Details on rigging and mission timing can be finalized at this time. 273d ASH Co (Hvy) Operations - Vung Tau 2291.


9. Blowing Debris. Rotor wash speeds for the CH-54 at maximum gross weight approximate 120 knots. The landing zones picked should therefore be clear of tents, and buildings. An LZ with a radius of 200 feet should be selected. Equipment, ponchos, boxes and other debris must be policed up regularly in the LZ. Canvas, if ingested by the Crane's rotor system, would almost certainly cause a major accident.

10. Necessary information for mission requests:

- a. Type equipment to be lifted.
- b. Weight of equipment.
- c. Exact location of pick-up zone.
- d. Exact location of drop-off zone.
- e. Frequency and call sign of pick-up zone.
- f. Frequency and call sign of drop-off zone.
- g. Time to arrive at pick-up zone.
- h. Fire support team coordination as necessary.
- i. Status of rigging. (Load must be rigged prior to CH-54's arrival.
- j. Additional information.

11. The CH-54 Skycrane's presence in the II FF V zone greatly improves the airlift capability available to commanders with heavy lift requirements in this area. Observance of the guidelines presented herein will make employment most effective and beneficial to all concerned.

1 Incl  
Checklist of CH-54

  
GARY R. HEFFNER  
MAJ TC  
Commanding

DISTRIBUTION:  
Special to all using units

DEPARTMENT OF THE ARMY  
273D ASSAULT SUPPORT HELICOPTER COMPANY (HVV)  
AFO San Francisco 96291

1 March 1968

CHECKLIST TO INSURE MAXIMUM USE OF CH-54 FLYING CRANE

1. Pick-up and drop-off zones, well policed and located away from tents and situated so that the CH-54 can approach and depart into the wind without over flying the camp.
2. Serviceable rigging material must be used to preclude failure in flight and subsequent loss of load.
3. Hook-up personnel must be equipped with protective mask or goggles and leather work gloves. They must be well briefed to eliminate their fear of the cargo hook thus facilitating the cargo hook-up.
4. Sufficient prepared loads of 14,000-16,000 lbs to keep the CH-54 working without delay. If there are lighter loads to be carried program them to be carried first when the CH-54's fuel load is greatest then move the heavier loads on subsequent trips as the CH-54 burns off fuel.
5. All loads must be attached to the CH-54's cargo hook with a metal clevis.
6. All items carried on equipment being moved (i.e. equipment in the bed of 2 1/2 ton trucks, equipment on trails of 155 howitzer) must be properly secured so that it arrives at its intended destination.
7. Call-signs and frequencies must be the same ones listed on the mission request. Personnel should be on the radio 30 minutes prior to scheduled reporting time. Alternate call signs and frequencies if available should be listed on the mission request.
8. Smoke grenades should be available at the P/U and D/O zones.
9. Single point pressure refueling nozzle (FSN USAF 4730-289-0096) should be provided in refueling areas to speed-up refueling operations and reduce maintenance problems.
10. Try to overwork the CH-54 and its crew - WE'LL BET YOU CAN'T DO IT.

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Incl 1 to Incl 4

DEPARTMENT OF THE ARMY  
273D ASSAULT SUPPORT HELICOPTER COMPANY (HVV)  
APO San Francisco 96291

30

9 April 1968

SUBJECT: After Action Report, CH-54A Conference

TO: Commanding Officer  
222d Combat Support Aviation Battalion  
APO San Francisco 96291

1. GENERAL.

a. A CH-54, Flying Crane conference was held at 0900 hours, 23 March 1968 in the Pacific Hotel, Vung Tau, RVN. Invitations to key members of all headquarters concerned with the operation and support of the CH-54 was made by UNCLAS Message 680189 (Incl 1) and followed up by FONECON. Conference attendees are listed at inclosure 2. The conference agenda is attached at inclosure 3.

b. Lieutenant Colonel Christopher B. Sinolair, Deputy Commander, 12th Combat Aviation Group opened the conference stressing the need for commanders and staffs at all echelons to be cognizant of the capabilities limitations, and operational considerations of the CH-54 Flying Crane.

2. PRESENTATION.

a. Major Gary R. Heffner, Commanding Officer of the 273d Assault Support Helicopter Company (Heavy), stationed at Vung Tau, RVN, acted as conference moderator and outlined the specific objectives of the conference. The objectives were:

(1) To inform commanders and staffs at all echelons about the problems CH54A units are experiencing and problems expected to be encountered in the future.

(2) To present some pertinent considerations when establishing policy relative to personnel, operations, and maintenance.

(3) To exchange general and specific information regarding lessons learned in CH54A operations by units involved in 4A Combat operations.

b. Major Heffner then presented a general briefing of the mission and capabilities of a typical heavy lift helicopter company which included mission statement, capabilities and organization.

Incl 5

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c. Personnel: Major Robert L. Stimmet, Executive Officer, 273d Assault Support Helicopter Company (Heavy) presented personnel problems facing the flying crane companies.

(1) Training and experience of enlisted personnel: Most of the enlisted personnel assigned to CH-54 companies go from basic training directly to maintenance and repairman courses. There is not a nucleus of experienced maintenance personnel except for senior enlisted personnel. Increased supervision and local training programs are necessary.

(2) Infusion: Due to the manner of deployment of the 273d and 355th and the fact there are only three flying crane companies in RVN each of the companies has a rotational hump which will be difficult to eliminate immediately. The most pressing requirement is to infuse the hard skill MOS personnel to insure the experience level, once acquired, does not suffer due to DEROS of a majority of maintenance personnel. The problem is not as great with the aviators as all who are in the program now and in the foreseeable future are highly qualified second tour aviators who require a minimum of in-country re-orientation. Because of that fact company operations would be affected only slightly during a DEROS month.

(3) Assignment of Personnel: Utmost care must be exercised at every echelon to insure CH-54 qualified personnel are assigned to CH-54 companies. The problem is particularly acute with enlisted maintenance personnel as until recently there was not an adequate method for identifying them. Identification of CH-54 engine qualified personnel is still impossible without a review of individual military personnel records. Consequently, many have been lost to the program because it was not known from their MOS they were CH-54 aircraft or engine qualified. Personnel records must be examined in detail to preclude malassignment of these critical personnel assets.

d. CH-54 Operations: Major Burl A. Zern, Operations Officer, 273d Assault Support Helicopter Company (Heavy) presented items of operational interest.

(1) IFR flying with single point loads: A program has been established in the 273d Assault Support Helicopter Company (Heavy) to investigate the degree to which IFR flying with single point loads can be safely accomplished. This is necessary to avoid a deterioration of mission accomplishments during the below VFR weather conditions existing at various times in RVN.

(a) The program includes hood flying to and from mission locations, hood flying with sling loads, accomplishment of GCA or ADF approach each time aircraft return to home base, investigation of alternate methods of rigging loads and techniques for navigating to and from mission locations. Examination of revised or additional instrumentation necessary to control the aircraft under IFR with an oscillating single point load. The program objectives are to conclude whether IFR flying with single point load is feasible and to make specific recommendations regarding necessary cockpit instrumentation.



(b) Captain Rice, Operations Officer, 478th stated the 478th had attempted to fly IFR with single point loads but determined that it was not feasible although they found they could carry loads 4 point under IFR conditions. The 478th made use of tactical GCA units at destination for navigation and let down.

(c) After questioning as to the extent of the 478th test of single-point IFR flying, documentation of experience, and specific recommendations to be made; it was determined that the 478th experience was useful but was not adequate to meet the objectives of the 273d program of test.

(2) Mission Information: Incorrect mission information reduces the effectiveness of heavy-lift support. Corrective action includes establishment of CH-54 qualified liaison officer at mission approving level, distribution of information regarding CH-54 operational requirements (Incl 4), and establishment of centralized aircraft mission control at supported units of divisional and separate brigade size (i.e. 1st Division's ACC, 25th Division AAE activity).

(3) Rigging of loads: Improper rigging and hook up procedures reduces mission effectiveness by increasing the instances of dropped loads and causing unnecessary delays in mission accomplishment.

(a) CH-54 cargo hook cannot accept the "double donut" often used with the chinook. Only a 40,000 lbs. clevis or an endless sling (donut) should be used to attach a load to the CH-54 hook.

(b) Units rigging loads should insure that rigging materials are serviceable and that proper rigging material are used.

(c) Devices that will discharge static electricity can be fabricated quickly and used effectively by hook-up crews. One such device is outlined in Incl 4.

(4) Single point pressure refueling sites: Reduced mission effectiveness results when the CH-54 must shut down to refuel. This is caused by the increased time to refuel and therefore increased vulnerability, increased maintenance problems some of which require repair in the field. A list of airfields in III and IV CTZ at which single point pressure refueling nozzles (FSN 4730-289-0081) should be established and maintained is attached as inclosure 5.

(5) Repair of CH-54 which malfunctions in the field. A flyaway maintenance kit (Incl 6) is established in the 273d ASH Co (Hvy) which includes most items necessary to effect field repairs. Everything necessary to accomplish all repairs cannot be carried on the aircraft due to size and weight limitations. Due to the low density of in-country CH-54 assets it is imperative that immediate response to field repair requirements is possible. This requires the assignment, to all CH-54 companies, of one UH-1D helicopter for this purpose.

6. CH-54 Supply and Maintenance: Major Robert F. Sternat, Commanding Officer, 652d Transportation Detachment (D.S.) presented items of interest regarding supply and maintenance.

(1) Organization for Maintenance. The Maintenance Platoon, 273d Assault Support Helicopter Company and the 652d Transportation Detachment have been combined into a consolidated maintenance organization with a single maintenance officer responsible for maintenance effort. This consolidation facilitates the accomplishment of maintenance by permitting:

(a) Elimination of duplicate chains of command, reference libraries and administration.

(b) Concentration of manpower on maintenance tasks and allows organizational personnel to accomplish direct support maintenance when supervised by direct support personnel.

(c) Establishment of a technical supply activity capable of operating 24 hours per day when required.

(d) All non-commissioned officers to occupy a position of adequate supervision.

(e) More effective tailoring of a maintenance team to support a flight platoon if deployed separately.

(2) It was brought out through open discussion that the 355th Aviation Company and the 478th Aviation Company have very similarly organized their maintenance effort. Further, MTOE action recently initiated at 1st Aviation Brigade will permit this organization for maintenance to be recommended as a permanent change to heavy-lift helicopter company TOE's (1-259G) thus eliminating the direct support detachment.

(3) Engine operation without Engine Air Particle Separators (EAPS). Experience dating back to 1965 indicates that a 65-75% reduction in engine life occurs if the engines are operated without EAPS. Three aircraft of the 273d Aviation Company (Hvy) were deployed to RVN without EAPS. Due to operational requirements, employment of the aircraft was necessary which resulted in expedited wear of 9th stage exit guide vanes in six engines to the point of unserviceability. This occurred over a period of approximately 98-150 flying hours.

(4) Automatic Flight Control Systems (AFCS): Adequate in-country support is not available for AFCS. The three CH-54 companies are in various states of preparedness to trouble shoot and/or to maintain the AFCS. Although few problems have been encountered with the AFCS action must now be taken to establish an in-country repair capability and float stock. Requisitions have been submitted but few items have been received.

(5) Excessive order-ship time: Excessive order-ship time is requiring abnormal use of EDP requisitions. Even though care is exercised to forecast parts requirements order-ship time is so great that it is usually necessary to eventually go EDP to obtain the required item. Emphasis by all supply echelons is necessary to reduce order-ship time to manageable levels.

(6) In-country repair Capability: Consideration should be given to establishing an in-country repair capability for:

(a) Welding of transition ducting found to be cracked during hot-end inspections.

(b) Fuel Cells

(c) Engine Fuel Controls

(7) Common item maintenance: A few cases of not being able to obtain repair assistance or DX on such items as radios, on a transient basis, has forced the CH-54 to return to Vung Tau to accomplish the repair. Maintenance activities should be directed to render assistance to CH-54's on a transient basis to preclude mission delay.

(8) Lubricants: There is a shortage of SATO 35 lubricating oil. All units have only a few gallons remaining. Action has been taken to obtain the oil but none has arrived in-country at this time. To reduce problems in contamination the packaging should be 5 gallon cans rather than 55 gallon drums.

3. RECOMMENDATIONS: It was recommended by a majority of conferees that -

a. Action be taken at USARV and 1st Aviation Brigade to insure identification of CH-54 qualified officers and enlisted personnel and that replacement personnel be assigned where the vacancies exist.

b. Infusion must be accomplished to reduce rotational humps. A meeting of personnel from the three CH-54 companies to develop an infusion plan was scheduled and held on 24 March 1968. An infusion plan was agreed upon and is being implemented at this time.

c. Each company must conduct an aggressive educational program for supported units to improve and expand the use of the CH-54. (Incl 4)

d. Further exploration and testing of a single-point IFR flying is necessary to be able to make specific conclusions and recommendations regarding its feasibility and/or improvement required.

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e. Each CH-54 company must be authorized and/or have on hand a UH-1 aircraft for field repair purposes and mission coordination.

f. An MFOE action is necessary to coordinate the company maintenance platoon and direct support detachment.


g. An in-country capability be developed to effect repair of:

- (1) Duct cracking noted during engine hot-end inspections.
- (2) Fuel Cells
- (3) Engine Fuel Control
- (4) Automatic Flight Control System.

h. Action be taken to insure that EAPS accompany all CH-54 aircraft deployed to RVN.

i. CH-54 conferences be held every four months.

6 Incl  
Incl 1-3 and 5  
Withdrawn, Hq, DA

  
GARY R. HEFFNER  
MAJ TC  
Commanding

33

FEASIBILITY TEST IN OFF LOADING COMBAT CARGO  
(Performed 11 Mar 1968, From Australian LSM)

36

1. Test Conditions.

- a. Time: 1400-1600 hours.
- b. Weather: Clouds 4,500 scattered, 30,000 broken, 6 miles visibility, temperature 81°, dew point 71, winds 120° at 26 knots, altimeter 29.77, density altitude 1,800 feet.
- c. Sea State: Current 110° 3 seconds 3-4 foot waves, swells 100° 4 seconds 4-6 feet, surf - 5 feet.

2. Test Equipment:

- a. CH-54A Helicopter.
- b. LSM: Landing ship medium, Beam 34' 6", Overall 203' 6", Well deck depth 7', Main Mast 55', Radar Mast 39', Drought 5' 9".

3. Conduct of Test.

- a. Phase One: LSM located in calm waters of Vung Tau Harbor. (YS 2749)
  - (1) Extract sand filled conex container (12,000 lbs) from bow of LSM. LSM riding in trough with winds starboard to port.
  - (2) Load sand-filled conex container (12,000 lbs) into bow of LSM. LSM riding in the trough with winds starboard to port.
  - (3) Extract sand filled conex container (12,000 lbs) from stern of LSM. LSM riding in the stern with winds off bow.
- b. Phase Two: LSM under way at 10-12 knots. (YS 2841)
  - (1) Extract sand filled ammunition boxes (13,500 lbs) from stern of LSM while ship is under way, headed fair into the wind.
  - (2) Extract sand filled ammunition boxes (13,500 lbs) from bow of LSM while ship is under way downwind.
- c. Phase Three: LSM riding in the bow, under way with no way on. (YS 3245) Winds from bow to stern.
  - (1) Extract sand filled ammunition boxes (13,500 lbs) from stern of LSM.
  - (2) Extract sand filled conex container (12,000 lbs) from bow of LSM.

Incl 4 to Incl 5

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FEASIBILITY TEST IN OFF LOADING COMBAT CARGO  
(Performed 11 Mar 1968, From Australian LSM)

4. Problems encountered and solutions.

a. During the first extraction, phase one, the CH-54A pilot maintained his hover reference by use of the ship's mast. As the LSM was riding in the trough, the sea swells caused the ship to roll and the mast to sway with the swells. The pilot did not immediately notice the mast was swaying laterally and attempted to keep up with the mast. This caused the aircraft cable and hook to sway erratically. It was found that the pilot must maintain his position over the ship by using the ship as a reference.

b. It was necessary to use a minimum of 50 feet of cable for all extractions in order to maintain aircraft clearance from the LSM mast. All extractions were made using 50-70 feet of cable. In order to expedite hook-ups, the aft pilot must begin letting cable out, on the aircraft commanders orders, while the aircraft is on final approach to the LSM.

c. It was found that the aft pilot's cyclic authority was insufficient to demands with the winds experienced during this test.

d. Due to the deep cargo well of the LSM, it was found that all extractions must be positive, using maximum allowable power in order to avoid the possibility of the load striking the freeboard of the LSM and causing possible damage to the load and/or the ship. The necessity of using a positive take-off technique will limit the load weight to 14,000 pounds, with the aircraft maximum gross weight no more than 41,000 pounds.

e. The one successful attempt to place a load into the LSM was found to be quite difficult. The difficulty was caused primarily by the cable length required which allowed the load to swing freely. The free swinging action of the load could possibly cause damage to ship's personnel, the ships bulkhead, superstructure, or the load itself. Due to difficulty encountered, placing loads aboard the LSM in its present configuration is not recommended as a normal procedure.

f. It was found that the most critical period encountered was between the time the load was hooked up until it was extracted, because the aircraft could no longer drift from its relative position over the load. In order to limit this critical period, the hook up team in the LSM must evacuate the load towards the bow or stern immediately after the hook up is accomplished to facilitate an immediate positive extraction of the load. It was found that this period of the operation requires utmost pilot coordination and cooperation.

g. The necessity of making a positive take-off as soon as possible after the load is hooked up requires that the aft pilot or the co-pilot apply initial collective as the pilot's attention is completely devoted to maintaining the aircraft's position over the LSM. The rigging straps on the load must be pulled tight prior to application of take-off collective and this can be done most easily by the aft pilot operating the cable hoist. The command "clear to pick up" must be given by the aft pilot as soon as possible after the hookup has been accomplished, rigging personnel are clear of the load, and the rigging straps have been pulled tight.

1/10/68

FEASIBILITY TEST IN OFF LOADING COMBAT CARGO  
(Performed 11 Mar 1968, From Australian LSM)

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h. In the CH-54A, serial number 412 and subsequent, the aft pilot's visibility to the right side of the aircraft is unsatisfactory due to the fuselage structure. This fact must be taken into account when positioning the aircraft over the LSM for hookup.

i. The stern of the LSM offers the best location to place loads for extraction as it lessens the hazard created by the LSM mast. The best position for the LSM is heading into the wind, as this gives the aircraft maximum room for maneuvering over the load.

j. Extracting loads while the LSM is under way downwind was found to be quite difficult due to the necessity for the aircraft to hover essentially backwards (even though it may be maintaining a positive air-speed) for hookup and the difficulty of positioning the aircraft over the load for hookup. Extracting loads while the LSM is under way downwind is not recommended as a normal procedure.

k. Extracting loads while the LSM is under way upwind proved no more difficult than the extraction accomplished while the LSM was stationary. The added advantage for the aircraft of a higher relative headwind is gained in this method of extraction.

l. It was found that the LSM, if improperly positioned, could preclude load extraction or at least make it extremely difficult, therefore; positive radio contact must be maintained between the LSM and the aircraft in order to reposition the LSM when necessary.

m. It was found that, due to the positioning of the aircraft over the load in the LSM, either the pilot or the co-pilot would not have sufficient visibility of the LSM to effect the pickup. A chin bubble in the aircraft would be desirable.

n. The time required to effect extraction ranged between  $1\frac{1}{2}$  to 3 minutes from the time the aircraft came to a hover to the time the load was extracted.

o. This operation definitely required the use of 3 pilots. Due to the limited visibility of the forward-facing pilots, the aft pilot in two instances was required to apply the initial collective.

5. Recommendations:

a. Cargo barges towed to position by the LSM would facilitate off-loading as they would provide the pilot a stationary reference for hovering in position and would eliminate the use of the long cable length required due to the height of the LSM mast. Off loading would be further expedited by the use of barges as the  $1\frac{1}{2}$  to 3 minute hover hook-up time could be cut to 10 seconds.

b. A cargo deck on the bow or stern of the LSM would eliminate the problems encountered extracting loads out of the deep well of the LSM

FEASIBILITY TEST IN OFF LOADING COMBAT CARGO  
(Performed 11 Mar 1968, From Australian LSM)

A method of positioning the loads on the cargo deck fast enough to keep up with the aircraft's turn around time (6 minutes) would be required.

c. Folding or removing the LSM mast would allow the aircraft to extract loads at a lower hover altitude thereby gaining additional reference to the ship and decreasing the time required to hook the load in its present configuration.

6. Conclusion: Off loading the LSM by CH-54A is feasible on a routine basis.



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DEPARTMENT OF THE ARMY  
273D/652D MAINTENANCE OPERATIONS  
APO San Francisco 96291

8 March 1968

MAINTENANCE DIRECTIVE  
NUMBER 13-68

SUBJECT: Items to be carried aboard all CH-54A Aircraft

TO: See Distribution

1. Items listed below will be carried aboard each aircraft on each flight.

a. General Items

|   |                   |               |
|---|-------------------|---------------|
| 4 Meals, C - Rations  |                   |               |
| 1 Water Jug   |                   |               |
| 1 Tool Box, General Mechanics   |                   |               |
| 1 TM 55-1520-217-20   |                   |               |
| 1 TM 55-1520-217-20P  |                   |               |
| 1 TM 55-1520-217-35   |                   |               |
| 1 TM 55-1520-217-10   |                   |               |
| 2 Breast Plates (Armor)   |                   |               |
| 3 Flak Jackets  |                   |               |
| 1 Survival Kit  |                   |               |
| 1 Gallon 7808   | MIL-L-007808F     | 9150-782-2627 |
| 3 Gallon 5606   | MIL-H-5606B       | 9150-223-4134 |
| 1 Gallon SATO 35  | SATO 35           | 9150-935-4090 |
| 2 Pounds GOB  | MIL-G-25537A(ASG) | 9150-616-9020 |
| 1 Quart 21260   |                   |               |
| 1 Funnel-Quart Capacity   |                   |               |
| 1 Hand Grease Gun w/Flex Extension                                    |                   |               |
| 2 Clevis (40,000 lb.)   |                   |               |
| 1 Single Point Refueling Nozzle w/<br>adapters to 1½" hose to 2" hose |                   |               |
| 1 Can-Ammo (10 mag M-16, 18 Rounds<br>M-79)                           |                   |               |
| 1 Hand-held Spotlight   |                   |               |
| 2 Flash-lights  |                   |               |
| 1 Load Leveler-walkaround cord  |                   |               |
| 1 Walk-around mike cord   |                   |               |
| 6 Smoke grenades  |                   |               |

Incl 6 to Incl 5

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8 March 1968

SUBJECT: Items to be carried aboard all CH-54A Aircraft (Cont'd)

## b. Repair Items (Flyaway Kit)

|  |                |                |
|--|----------------|----------------|
| 1 Switch, APP 110 PSI                                      | 37697-0        | 2910-919-0189  |
| 1 Filter, Fuel   | 49881          | 2915-808-4354  |
| 2 Belt "V"   | 3V600          |                |
| 4 "4" Ring, Banjo  | MS28775-026    | 5330-631-1342  |
| 4 "0" Ring, Banjo  | MS28774-026    | 5330-834-6676  |
| 2 "0" Ring, P&D Valve                                      | MS9020-12      | 5330-582-2577  |
| 2 "0" Ring, Fuel Filter                                    | MS9021-154     | 5330-585-7864  |
| 2 "0" Ring, Fuel Filter                                    | 29822-191      | 5330-802-7481  |
| 2 "0" Ring, Oil Filter                                     | 405969         | 2840-799-8050  |
| 1 "0" Ring, Trans Oil Filter                               | 35016C         | 5330-171-6411  |
| 1 "0" Ring, Trans Oil Filter                               | MS28778-3      | 5330-835-7485  |
| 1 "0" Ring, Trans Oil Filter<br>(Leather Washer)           | MS28777-3      | 5330-866-4946  |
| 2 Gaskets M-2  | AS10001        | 5330-738-0543  |
| 2 Flox line 3000 PSI, 5 ft. long<br>w/7/8" Female Fittings |                | 4720-790-8094  |
| 1 Main Rotor Blade Tip Cap                                 | 6415-20209-041 | 1615-835-4879  |
| 12 Main Rotor Blade Tip Cap Screws                         | AN 509-8R8     | 5305-702-5069  |
| 1 "0" Ring APP 110 PSI Sw                                  | 34666-4        | 5330-952-0067  |
| 1 Hose Assy-Hoist  | 8845-3E172000  |                |
| 2 Flex line 3,000 PSI, 3 ft.                               |                | 4720-H-23-2901 |
| 2 Unions   | AN 919-8       |                |
| 2 Reducers   | AN 919-10      |                |

2. NCOIC of the Flight Section will take action to requisition those items listed in the "Flyaway Kit" which are not now aboard each aircraft.

3. All items listed in the flyaway kit will be packaged in a box, securely wrapped and marked as to the contents. The "Flyaway Kit Box," will not be opened unless items are required in the field. If an item is used, the flight engineer and/or crew chief will, immediately upon their return to home stations, advise the NCOIC Flight Section, of the items used and requisition a like item(s) from Aircraft Supply.

4. Aircraft Supply Officer will keep a record of the items located within the "Flyaway Kit" of each Aircraft.

5. The flight engineer and crew chief of each aircraft will insure that the items listed in par 1a and b above are aboard each aircraft for each flight.

Incl 6<sup>1</sup>

SUBJECT: Items to be carried aboard all CH-54A Aircraft 8 March 1968  
(Cont'd)

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DISTRIBUTION:

- 1 - Maint Opns Dir File
- 1 - CC, 273d ASH Co (Hvy)
- 1 - 652d Tech Supply
- 1 - Quality Control
- 1 - Dir Maint
- 1 - NCOIC Flt Section
- 1 - Maint Plt Ldr, 273d
- 1 - Allied Shops Plt Ldr
- 1 - Maint S/B
- 1 - Ea Flt Engr
- 1 - Ea Crew Chief

ROBERT F STERNAT  
MAJ TC  
Dir Maintenance

Incl 6<sup>2</sup>

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DEPARTMENT OF THE ARMY  
HEADQUARTERS, 222D COMBAT SUPPORT AVIATION BATTALION  
APO San Francisco 96291

AVGC-IC

7 April 1968

SUBJECT: After Action Report, CH-47 Symposium, 3 April 1968

Commanding Officer  
12th Combat Aviation Group  
ATTN: AVGC-SC  
APO 96266

1. The purpose of this CH-47 symposium was for key personnel of CH-47 units and their supporting maintenance units to discuss existing and potential problem areas relevant to CH-47 operations in the Republic of Vietnam. An initial invitation was dispatched to the CH-47 units, (Incl 1) and was followed up by telephone to insure all participants were notified. Inclosure 2 gives the names of the attendees.
2. The agenda (Incl 3) was followed quite closely; the stated time frames were adequate for open discussion. All attendees contributed immensely to the discussion; it is felt that a vast amount of expertise was imparted.
3. The items listed in the agenda were covered and many additional points were discussed. The discussion and conclusions of the more relevant points are as follows:

a. Item Combined CH-47 Operations

Discussion: With the requirement of centralized control over CH-47 "Chinook" assets during large scale combined operations, it is recognized that one command unit must have the overall responsibility of these assets. This responsibility is a specified mission of the 222D Combat Support Aviation Battalion, who will normally assume overall mission control. Combined operations are becoming more common where aircraft from two or more units are participating in the same operation. Previously, command problems have arisen as to who is actually the "mission lead", i.e. (1) the commander with the most aircraft (2) the ranking commander (3) the commander in whose assumed area of responsibility the operation falls in.

Conclusion: The 222d CSAB will normally assume overall control of combined CH-47/54 operations. The unit having the preponderance of aircraft on the mission will be designated as "mission lead". Each unit will have within its own unit a "unit lead" who is responsible to the "mission lead" for the aircraft from his unit. Responsibilities of the "mission lead" will be as directed by CO, 222d CSAB, but may include any or all of the following: Overall coordination of the mission, determination of aircraft requirements, and mission planning. Responsibilities of "unit lead" are to disseminate information to aviators of his unit, effect unit coordination, replace crews and aircraft as necessary to continue mission commitment, and keep "mission lead" informed. Only the "mission lead" can release aircraft from the mission.

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Aircraft will utilize their company UHF command radio nets for coordination and their FM radios to clear artillery, pathfinder coordination, etc. Anyone desiring to speak to another element can do so by switching to the other units UHF command net (all frequencies are given in 12th CAG SOI). A unit tasked with the responsibility of providing a maintenance aircraft will insure that a maintenance officer is aboard as a pilot and adequate technicians and repair parts are aboard to make routine repairs on site. Suggested items to be taken were selected hydraulic lines, radio "black boxes", actuators, etc.

b. Item Dropped loads

Discussion: The problem of dropped loads was discussed and was of the utmost concern to all. Major Fairweather, 1st Aviation Brigade S-3 section, discussed the frequency of dropped loads throughout the 1st Aviation Brigade and findings relevant to these dropped loads.

Conclusion: Pierced steel planking is being carried by units more often now than previously. This material cannot be loosely loaded into cargo nets and successfully transported. Supported units must be made aware of their problem and the risk of a dropped load presented to them. The decision to accept the risk must be made by the supported unit OIC. Much of the current rigging equipment used by supported unit's is in a deplorable state and should be replaced. The stock status of this rigging equipment, as of 31 March 1968 (Inclosure 4), in the Republic of Vietnam was given. Pathfinders must be utilized to the maximum to supervise and check rigging. As the ultimate responsibility of the dropped load rests with the aircraft commander carrying the load, he should endeavor to have someone check the rigging of the load, even if only the Flight Engineer, before transporting it.

c. Item CH-47 "Chinook" mission processing in AAE

Discussion: Captain Laske, LNO 222d Combat Support Aviation Battalion, presented the mission processing channels from the supported units thru II Field Forces Vietnam down to the aviation units. Of particular significance was the manner in which CH-47 aircraft are now scheduled, so that all companies are flying approximately the same number of hours per month. The criteria of "Tac E" and "CE" was discussed so that the aviation units would better understand the importance of their mission. All units were encouraged to continue submitting Unsatisfactory Mission Reports, so that AAE can be kept informed of any CH-47 misutilization.

d. Item Personnel

Discussion: Infusion percentages of all CH-47 "Chinook" companies were discussed to include officers and enlisted men.

Conclusion: All companies are infused within the USARV guidelines and no critical DEROS humps are evident. There is an equal shortage of some critical MOS'S within the companies, but this can be alleviated only by people being assigned to the 12th Combat Aviation Group for reassignment to the units. The 213th ASHC does not have an Instrument Flight Examiner.

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SUBJECT: After Action Report, CH-47 Symposium, 3 April 1968

e. Item Aviation Safety

Discussion: The 12th Combat Aviation Group CH-47 accident rate is below the USAFV maximum acceptable rate of 10 accidents per 100,000 flying hours. A brief review of the CH-47 accidents occurring in the Republic of Vietnam during the past nine months was presented along with cause factors.

Conclusion: It was emphasized that there is a need for continued aggressiveness in unit safety programs. It was recommended the following points be evaluated

1. Mission planning- educate the supported unit personnel concerning mission safety factors including maximum loads, LZ-PZ preparation, debris and dust suppression.
2. Replacement of crews/aircraft during any extended daily operation.
3. Close supervision of newly assigned aviators.
4. Weather- educate pilots re local weather phenomena
5. Continual practice of emergency procedures

f. Item Aircraft Maintenance

Discussion: The capabilities of the Corpus Christi Bay (FAMF) were discussed and units were informed of the procedure to have work accomplished by this facility. Supply problems of critical items were discussed and no representative present could offer a solution. It was noticed that the establishment of parts expeditor personnel in Saigon has greatly assisted in receiving repair parts. Major Graham, 1st Aviation Brigade S-4 Section, presented a brief resume of the 12th periodic inspection program and float aircraft availability.

Conclusion: The capability of the Corpus Christi Bay (FAMF) has not been fully exploited by CH-47 "Chinook" units. For additional information on the Corpus Christi Bay, units were advised to contact Captain Cummings, at Vung Tau, Corpus Christi Bay 210.

g. Item CH-47 Operational SOP

Discussion: The 222d Combat Support Aviation Battalion was tasked with producing an SOP for CH-47 Operations. The 205th ASHC produced the initial working paper of the SOP, which was staffed by the 222d CSAB Standardization Board and S-3. Minor changes were incorporated into this initial working paper and a draft was proposed (Incl 5). This draft SOP was thoroughly covered at the symposium and additional minor changes were recommended. The changes are reflected by pen and ink in Inclosure 5.

Conclusion: The SOP for CH-47 Operation has been needed by CH-47 "Chinook" units and will be used by the 222d Combat Support Aviation Battalion.

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4. Conclusions: It was concluded that symposiums are highly beneficial and essential to keep all units informed of new operational techniques and potential problem areas. It is felt that all units with personnel in attendance will profit greatly from the provocative discussions. With this wealth of experience gathered in one conference room, many potential problem areas were thwarted.

5. Recommendations:

a. That the 222d Combat Support Aviation Battalion CH-47 Operation SOP be utilized throughout CH-47 "Chinook" units in the 12th Combat Aviation Group.

b. That the 213th ASHC be assigned an instrument flight examiner as soon as possible.

c. That combined CH-47 operations be conducted in the manner stated in 3 a. above.

d. That a CH-47 symposium be conducted quarterly or on an "as required" basis.

*George W. Adamson*

GEORGE W. ADAMSON  
LTC, Infantry  
Commanding

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as

Incl 1-4 Withdrawn, Hq, DA

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Annex (Operations SOP CH-47) 222nd

SECTION I GENERAL

1. PURPOSE: To provide basic guidance, procedures and policies for operational activities within this battalion.
2. APPLICABILITY: This SOP is applicable to all assigned and attached units.

SECTION II OPERATIONS

1. MISSIONS

a. Assignment:

- (1) All missions will be assigned by the 12th Combat Aviation Group, Army Aviation Element (AAE) located at II Field Forces (II FFV) through the 222nd Combat Aviation Battalion Operations Center (BOC).
- (2) II FFV will designate the unit with command responsibility when two or more CH-47 units are combined on a mission.
- (3) Aircraft recovery missions are received directly from the Transportation Maintenance Company (DS) having responsibility for the recovery, or upon notification from BOC.
- ~~THIRTY (30)~~ (4) Standby aircraft will be prepared to the airborne within ~~fifteen (15)~~ minutes after notification. Report time off to BOC. *(EXPEDITE TO BEAT THIS 30 MINUTE MAXIMUM TIME, WHENEVER POSSIBLE)*
- (5) Aircraft commanders designated for night stand-by missions will have current instrument ratings *WHEN POSSIBLE.*
- (6) Each company will be prepared to commit, as a minimum, six aircraft daily.

b. Planning and Preparation:

- (1) Preliminary coordination will be conducted by II FFV and transmitted through BOC for each mission:
  - (a) Mission number
  - (b) Pick-up zone coordinates
  - (c) Landing zone coordinates
  - (d) Supported unit call signs
  - (e) Supported unit frequencies
  - (f) Items to be lifted

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(g) Number of sorties

(h) Starting times

(2) Liaison officers and Pathfinder teams will be used on all artillery lifts, battery size or larger, regardless of number of aircraft involved.

(3) Pathfinder teams will be utilized when deemed appropriate by company operations. Their technical knowledge and proficiency assists immeasurably in the successful accomplishment of the mission. In addition, Pathfinders will be employed habitually when supporting newly assigned units, or when a unit has displayed a lack of proficiency in rigging loads.

2. MISSION EXECUTION:

a. All decisions by commanders at all levels, to include aircraft commanders, will be guided by a sincere desire to accomplish the mission.

b. Reports

(1) Companies will transmit essential mission information to BOC at least once an hour while missions are in progress.

(2) Mandatory reports:

- (a) Emergencies
- (b) Dropped loads
- (c) Aircraft hits
- (d) Casualties

c. Crew requirements:

(a) All flights, by type indicated, will have the following minimum crew:

- (1) Operational missions: P-CP-FE-CE-G
- (2) Training and test flights: P-CP-FE-CE
- (3) Aircraft recovery: P-CP-FE-CE-G-G

(b) Additional personnel (medics, maintenance personnel etc.) will be used as the mission dictates.

d. Aircraft lighting: The lower grimes light will not be used. The upper grimes light will be used at all times. Position lights and grimes lights will be used at night as the tactical situation dictates.

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## e. Enroute and Approach Procedures:

(a) Enroute altitude will be 3000' absolute minimum whenever possible. Sound judgement should be exercised on short flights, consistent with the tactical situation.

(b) On approaches into LZ's, one pilot will fly the aircraft and the co-pilot will have his hands and feet on the controls ready to take over if necessary. Caution must be exercised by the co-pilot not to interfere with the control movements of the pilot.

(c) All crew members will wear the chest protector, and/or the protective vest, sleeves rolled down, gloves on.

~~OMIT (d) If feasible, two or more aircraft going into or out of the same area, without light fire team escort, will fly formation in such a manner that their guns will provide mutual coverage.~~

(e) Aircraft will not shut down at busy mini-ports, or at insecure locations.

(f) Pilots will attempt to perform a maintenance check of the aircraft at least at every other refueling.

## f. Light Fire Team Escort:

(a) Light fire teams (LFT) will be requested through DOC or the supported unit as required.

(b) LFT on station at the LZ require a minimum of 15 seconds to get into position to cover the take off or approach of a CH-47.

(c) Armed helicopters (excludes AH-1G, Cobra) have a maximum airspeed of 80 knots and a maximum climb of 500 FPM. Their total fuel is 1+50, they normally remain on station 01+30.

## g. Passenger Limitations:

(a) Generally, a maximum of thirty three US or Australian troops will be carried. All troops will be seated w/safety belts fastened. Additional US or Australian troops may be carried depending upon the urgency of the tactical requirement and prior coordination w/the supported ground commander.

(b) ARVN Troops: No limitation to number except for ACL (Aircraft Cargo Limitations).

(c) Refugees: No limitations to number except ACL. The number of refugees will be specified by the senior American advisor present.

## 3. Appendixes:

## a. Appendix 1 (Liaison Officers and Pathfinder Responsibilities)

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- b. Appendix 2 (Maintenance Procedure Checklist)
- c. Appendix 3 (Mission and Survival Equipment Checklist)
- d. Appendix 4 (External Load Operations)
- e. Appendix 5 (Crew Member Duties)
- f. Appendix 6 (Downed Aircraft Procedures)
- g. Appendix 7 (Communications)
- h. Appendix 8 (In-Country Aviator Orientation)
- i. Appendix 9 (Instrument Training Program)
- j. Appendix 10 (Suggested Lesson Outline for Mobile Training Team Class)
- k. Appendix 11 (CH-47A & B 90 Day Standardization Checklist)
- ~~l. Appendix 12 (M-23 Armament System)~~  
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Appendix 1 (Liaison Officer and Pathfinder Responsibilities) to Annex  
(Operations SOP CH-47) 222nd Combat Support Aviation Battalion SOP

## 1. LIAISON OFFICERS RESPONSIBILITIES:

a. Effect coordination with and provide technical assistance to the supported unit as soon as notified by BOC of pending large scale operations.

b. Determine data as shown in 1st Aviation Brigade Handbook, dated 1 Feb 67, page 16.

## 2. PATHFINDER RESPONSIBILITIES:

a. Accompany Liaison Officer to the supported unit.

b. Assits and coordinates with the supported unit in selecting and marking of loading areas for aircraft; determines size and number of loads.

c. Arrive in PZ or LZ 30 - 45 minutes prior to the scheduled aircraft arrival time *OR WITH FIRST AIRCRAFT IN PZ OR LZ.*

d. Breakdown and spot the loads in the PZ.

e. Check rigging of all loads.

f. Mark touchdown and pick up spots with smoke.

g. Control arriving aircraft in the PZ and LZ by radio.

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Appendix 2 (Maintenance Procedure Checklist) to Annex (Operations SOP)  
22nd Combat Support Aviation Battalion SOP

Upon encountering maintenance difficulties the following procedures will be used:

1. Continue the mission and request a replacement aircraft at a specific time and most practical location.
2. If unable to continue the mission, return the aircraft to home station. Call ahead to have a replacement aircraft waiting, or request a replacement be flown to a specific location.
3. If unable to return to home station, the aircraft commander is required to notify company operations or BOC as soon as possible, and advise control of the following items:
  - a. Mission and sortie status
  - b. Aircraft location
  - c. What is wrong with aircraft (symptoms)
  - d. What parts are required and all pertinent data concerning the needed parts.
  - e. Estimated time when mission can be resumed.
4. Aircraft commanders should suggest any practical deviations which would assist the company and BOC in meeting all scheduled times for missions.

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Appendix 2 (Maintenance Procedure Checklist) to Annex (Operations SOP)  
22nd Combat Support Aviation Battalion SOP

Upon encountering maintenance difficulties the following procedures will be used:

1. Continue the mission and request a replacement aircraft at a specific time and most practical location.
2. If unable to continue the mission, return the aircraft to home station. Call ahead to have a replacement aircraft waiting, or request a replacement be flown to a specific location.
3. If unable to return to home station, the aircraft commander is required to notify company operations or BOC as soon as possible, and advise control of the following items:
  - a. Mission and sortie status
  - b. Aircraft location
  - c. What is wrong with aircraft (symptoms)
  - d. What parts are required and all pertinent data concerning the needed parts.
  - e. Estimated time when mission can be resumed.
4. Aircraft commanders should suggest any practical deviations which would assist the company and BOC in meeting all scheduled times for missions.

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Appendix 3 (Mission and Survival Equipment Checklist) to Annex (Operations SOP CH-47) to 222nd Combat Support Aviation Battalion SOP

All crew members will have the following on their person or the aircraft prior to flying any mission.

1. PERSONNEL:

- a. Fatigues (Sleeves rolled down while airborne)
- b. Flying Gloves
- c. Combat Boots - (Jungle Boots if leather combat boots not available)
- d. Protective helmet (with visor)
- e. Identification Tags
- f. Identification Card
- g. Shot Record
- h. Geneva Convention Card
- i. Chest protector or protective vest
- j. Personal weapon with basic load
- k. Survival knife
- l. Personal survival kit

2. AIRCRAFT EQUIPMENT:

- a. SOI
- b. Blood chit for each crew member
- c. Machete
- d. 2 hot weather survival kits
- e. 5 gallon can of water
- f. 1 case of "C" rations
- g. 1 survival radio
- h. Aircraft armament to include:
  - (1) 2 M60 machine guns w/mounts

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Appendix 3 continues (Mission and Survival Equipment Checklist) to  
Annex (Operations SOP CH-47) to 222nd Combat Support Aviation Battalion

(2) TOE rifles (M-14 or M-16)

(3) 1 M79 grenade launcher

i. A basic load of ammunition for all aircraft weapons

j. A basic load of signal smoke (three red, three green, two  
yellow, four white)

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Appendix 4 (External Load Operations) to Annex (Operations SOP CH-47) to 222nd Combat Support Aviation Battalion SOP

1. Loads should be arranged right to left or front to back. This facilitates landing and take off.
2. Loads should be spotted in front of the aircraft touch down point.
3. Combination loads will be spaced to permit the aircraft to land between the loads, with the internal load to the rear.
4. Loads should be spread far enough apart to permit the simultaneous loading of more than one aircraft at a time.
5. Two nylon doughnuts will be used on all slings, except when using the 20,000 lb. Aeroquip 4 - legged sling. (FSN 3940-902-3080)
6. The unit to be lifted will provide all essential equipment and personnel for hook up teams.
7. The pilot will take his guidance on hook-up from the flight engineer.
8. Prior to departing home station, aircraft commander, pilot and flight engineer will each check their hook releases.

a. HOOK-UP PROCEDURES:

Pilot: "Set me up." (Means, arm the hook turn radios OFF, and monitor RPM.)

Co-Pilot: "Hook is armed, radios OFF, and monitoring RPM."

Flt Engr: "My radios are OFF and my visor is down."

Flt Engr: (FE will direct the pilot over the load by giving a direction to move and the distances in feet. Example: Back two; Right one; Down two.)

Flt Engr: "Hold". "You are hooked." Pick it straight UP. (At times the aircraft may not be directly over the load; therefore, it may be necessary for the FE to direct: "Back two; right two; forward one," as the aircraft takes the slack out of the sling.) When slack is out of the sling and the area around the load is clear. "Your sling is tight, the hook-up man is clear, pick it up."

Flt Engr: "Load is clear of ground." (In case of a piggy back load, guide the pilot over the piggy back load; "Piggy Back is clear of the ground.")

Flt Engr: "The load is ten feet off the ground, you are clear for take-off."

Appendix 4 continued (External Load Operations) to Annex (Operations SOP CH-47) to 222nd Combat Support Aviation Battalion

Left Gunner: "Clear Left"

Right Gunner: "Clear Right"

Pilot: (Upon reaching 50K IAS and 500ft AGL) "Enroute"  
(Enroute means, hook master switch OFF, and radios ON.)

Flt Engr: "My radios are ON."

b. IN FLIGHT:

Flt Engr: (Monitors load during flight and advises the pilot of any unusual conditions.)

c. DROP-OFF PROCEDURES:

Pilot: (Passing through 50K IAS & 500ft AGL) "Set me up."  
(Set me up means, arm the hook, turn my radio OFF, and monitor my RPM.)

Pilot: "We are on final and landing spot of load is, on smoke, marker panel, etc, etc."

Co-Pilot: "Hook is armed, radio OFF, and monitoring RPM."

Flt Engr: "My radios are OFF and my visor is down."

Flt Engr: "I have the spot in sight."

Flt Engr: "You are 50 feet above the ground, 40, 30, 20, 10."

Flt Engr: "You are over the spot."

Flt Engr: "Down 10, 5, 3, 2, 1."

Flt Engr: "The load is on the ground down two (2) feet." (If the load is piggy back, piggy back is on the ground. For piggy back loads, direct the pilot, left, right, forward, or back, to prevent the load from being placed on the piggy back.)

Flt Engr: "The sling is slack, the load is released." (NOTE: The flight engineer releases the load during normal operations)

Flt Engr: "The sling is free."

Flt Engr: "Clear for take-off."

Appendix 4 continued (External Load Operations) to Annex (Operations SOP  
CH-47) to 222nd Combat Support Aviation Battalion SOP

LeftGunner: "Clear left"

RightGunner: "Clear right"

Pilot: "Enroute" (Enroute means, hook master switch OFF,  
and radio ON.)

Flt Engr: "My radios are ON."

Appendix 5 (Crew Member Duties) to Annex (Operations SOP CH-47) to 222nd  
Combat Support Aviation Battalion SOP

1. GENERAL: The primary duties of the enlisted crew members during flight operations are left gunner, right gunner, and flight engineer. The assigned flight engineer and crew chief may alternate between the right gunner duties and the flight engineer duties because of the fatigue factor involved. The assigned flight engineer is responsible for all the flight engineers duties regardless of his location.

2. FLIGHT ENGINEER RESPONSIBILITIES:

- a. Normally the flight engineer will ride in the rear ramp area.
- b. During external load operations, he will assist the pilot in hook up, monitor the load as necessary during flight, and assist the pilot during approaches by directing the load to the proper area. He will insure that the cargo hook releases properly and the load is free from the aircraft.
- c. He will be responsible for placement and tie down of all internal loads. He will monitor the weight of internal loads and advise the pilot if it appears the load is too heavy or a safe CG cannot be maintained. He will insure, that whenever possible, all passengers are seated and have safety belts.
- d. He will observe out the rear of the aircraft during take offs and landings when he is not required to be present at the rescue hatch during sling or hoist operations. He will assist the pilot in selecting a safe touch-down point in rough areas by observing through the rescue hatch, or out the rear of the aircraft whichever gives him the most advantageous view.
- e. He will conduct a check of the ramp area at least once each 30 minutes and report the results to the pilot.
- f. He will advise the pilot when the chocks are removed, the ramp is up, and that the aircraft is ready for flight prior to each take off.
- g. During refueling operations or when the aircraft is shut down, he will insure that the aircraft is ready for flight prior to each take off.
- h. He will insure that emergency water, rations and survival gear are on board for all flights.
- i. He will insure that aircraft weapons are safe and secured when landing in a secure area.
- j. He will insure that all weapons carried on board by combat troops are clear and radio antennas are down.

Appendix 5 continued (Crew Member Duties to Annex (Operations SOP CH-47)  
to 222nd Combat Support Aviation Battalion

### 3. RIGHT AND LEFT GUNNER RESPONSIBILITIES:

- a. They will observe all areas on their side of the aircraft (ground and air) for other aircraft, obstructions, and personnel. They will immediately report the position of other aircraft, obstructions, or enemy to the pilot, using the clock and high/low system.
- b. They will clear their side of the aircraft on all takeoffs and landings and will report the position of any other aircraft sighted to the pilot, using the clock system. On touchdown they will observe for clearance from foxholes, stumps or other obstructions. They will give the pilot a "Clear Left" and a "Clear Right" upon both takeoff and touchdown, and advise him of any hazards prior to touchdown.
- c. They will comply with the rules of engagement that they were briefed on by the aircraft commander prior to the flight.
- d. During aircraft shutdown, the right gunner will dismount and position himself at the right front of the aircraft until the rotors stop turning to prevent personnel and equipment from being struck by the forward rotor blades. Before leaving his position, he will insure that one of the forward rotor blades is positioned at the 30 degree point.
- f. During internal loading, they will assist the flight engineer as directed unless they are required to remain at the gunner's position.
- g. They will perform all other duties as directed by the pilot and flight engineer.

### 4. RESCUE HOIST OPERATIONS:

- a. During a rescue hoist operation an additional crew member will be added. The extra crew member will assume the duties of the right gunner, leaving the flight engineer and crew chief free to perform the hoist operations.
- b. The flight engineer and crew chief will both occupy positions near the rescue hatch, where they can observe the pickup of the load.
- c. The flight engineer will lie aft of the hatch and direct the pilot over the load. Normally he will use one hand to steady the cable and one to operate his microphone button.
- d. The crew chief will operate the hoist control handle. He must be able to see the load so no voice command is necessary for taking in or paying out cable. When the load is in the hatch, both men will assist in pulling it into the aircraft.

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Appendix 6 (Downed Aircraft Procedures) to Annex (Operations SOP CH-47) to 222nd Combat Support Aviation Battalion

1. GENERAL: Emergency actions must be based on the decision of the senior air crew member present, and this SOP does not limit courses of action, but prescribes basic actions, that with little modification, will be applicable in most cases.

2. DEFENSE PLAN: (Assuming no serious injury<sup>3</sup> or fire, which would take precedence.)

a. Aircraft Commander remains seated, coordinating rescue/recovery efforts by radio.

b. Pilot leaves aircraft; taking survival kit, ARC-RT 10 radio, and individual weapon to direct defense perimeter.

c. Flight Engineer remains with aircraft to determine extent of damage and necessary repairs, which he reports to the Aircraft Commander.

d. Crew Chief removes right M-60 ammo, and smoke grenades, and defends right side of aircraft, or as directed by pilot.

e. Passengers, if present, will be utilized to reinforce the perimeter as directed by the pilot utilizing available officer and/or NCO personnel.

3. NIGHT PROCEDURES: Normally, radio will be the best method of directing night rescue efforts. Crew duties remain similar to daylight duties, but defensive perimeter should be tightened to prevent enemy infiltration. If power is available, radios and light may be utilized at the discretion of the aircraft commander. In "Hot" areas, it is inadvisable to show any light until rescue aircraft are in the immediate area. "Penguin" type flares, located within the emergency survival kits, will aid search aircraft in pinpointing downed crews. Tracer fire is not recommended without positive radio contact, as personnel overhead may mistake fire to be hostile.

4. INACCESSIBLE AREA: If an aircraft is forced down in heavy jungle or other difficult terrain, it may be possible for crew members to be lifted individually by hoist, litter, or crew harness; if not and the crew must move, rescue aircraft should establish an orbit which will overfly the downed crew, heading toward the nearest suitable area. The survival pack compass or the removed magnetic compass from the aircraft will aid in maintaining orientation.

5. ABANDONMENT PROCEDURES: If an aircraft must be abandoned, personnel, classified documents, weapons and radios will be evacuated if possible, in that order of precedence. If rescue is effected by UH-1, it may be impractical to remove all weapons and ammunition. Bolts or feeder covers should be removed, at a minimum, to preclude immediate use by the enemy. Authority to destroy downed aircraft rests with the CO, 222nd Combat Support Aviation Battalion and will not be delegated.

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Appendix 7 (Communications) to Annex (Operations SOP CH-47) to 222nd  
Combat Support Aviation Battalion SOP

1. Communication procedures, codes and signals used in operations will conform to the current SOI.
2. Artillery advisory FM frequencies will be monitored at all times while enroute from PZ's to LZ's.
  - a. While in the immediate vicinity of the PZ and LZ, aircraft will monitor pathfinder FM frequencies. If no pathfinders are available, the supported unit tactical FM frequencies will be monitored.
  - b. Company operations monitor UHF, FM and Battalion FM.
  - c. Brevity code (South East Asia Airfield Directory) will be used to minimize communications.

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Appendix 8 (In-Country Aviator Orientation) to Annex (Operations SOP  
CH-47) 222nd Combat Support Aviation Battalion SOP

1. All newly assigned aviators will be given the following in-country  
aviator orientation

a. Ground School

- |  |        |
|--|--------|
| (1) Map and Intelligence information                   | 30 Min |
| (2) SOI (use and security)                             | 30 Min |
| (3) Unit SOP   | 1 Hr   |
| (4) Unit Safety briefing                               | 1 Hr   |
| (5) Flight following                                   | 15 Min |
| (6) Review of ICAO, USARV and unit Regs                | 30 Min |
| (7) Operators handbook reviews (Normally taught by IP) | 1 Hr   |
| (8) Weather briefing                                   | 45 Min |
| (9) Medical evacuation procedures                      | 30 Min |
| (10) Artillery advisory systems                        |        |

b. Flight Training:

(1) Flight standardization check ride with an IP, conducted  
IAW USARV Form 177R.

(2) Several Flights on operational missions as pilot with a  
qualified instructor pilot.

c. This training should be completed NLT 14 days after arrival in  
RVN

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Appendix 9 (Hood Training Program) to Annex (Operation SOI CH-47)  
222nd Combat Support Aviation Battalion SOP

1. GENERAL: To preclude loss of life and equipment through lack of proficiency when forced to fly in instrument weather conditions.

2. STANDARDS FOR TRAINING:

a. True simulation of instrument weather conditions will be achieved with a partial windshield cover and chin bubble cover.

b. Each aviator will become proficient in conducting level, turning, descending, and climbing flight during instrument weather conditions.

c. Each aviator will become proficient in tuning and homing to a secure area utilizing FM, VOR, ADF, and RADAR/IFF navigation aids during simulated instrument conditions.

d. Each aviator will become proficient in performing GCA during simulated instrument conditions.

3. TRAINING TIME:

a. All hood training must be in conjunction with, and a projection of our regularly scheduled missions. A minimum of two hours per month will be flown by every aviator.

b. Hooded flights will be conducted between first take off in the morning to the first reporting point; the last take off at the end of the flying day enroute to home station; all other flights where hood training is practical; and only those flights if they are of fifteen minutes duration or more.

c. Discussion pertaining to IFR procedures will be scheduled on a recurring basis.

5. TRAINING RECORDS: Hood time of each aviator will be recorded by operations on DA 759.

Appendix 10 (Suggested Outline for MTT Class) to Annex (Operations SOP  
CH-47) 222nd Combat Support Aviation Battalion

1. Introduction
  - a. Purpose of class
  - b. Scope of class
2. Description of CH-47
  - a. Manufacturer
  - b. Engines
  - c. Transmissions
  - d. Rotor system
  - e. Fuel capacity
  - f. Dimensions
  - g. Cargo loading aids (hook, ramp, rollers, winch, ladder)
  - h. Avionics equipment w/emphasis on FM homer
3. Crew Duties
4. Capabilities & Limitations
  - a. 8000# max load
  - b. Size of LZ
  - c. Weather capability (also night)
  - d. Extensive maintenance requirements
  - e. Large volume of fuel
  - f. Occasionally weather will hinder operations.
5. Safety
  - a. Smoking
  - b. Earplugs
  - c. Approach & depart from side
  - d. Weapons, unloaded

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- e. Radio antenna danger
- f. Seat belt use
- g. LZ clear of trash
- h. Goggles for hook up man
- i. Static electricity

6. Planning the Air Move

- a. LNO & Pathfinder use
- b. Selection of FZ & LZ , (Size, dust, stamps)
- c. Availability of slings & smoke. Discuss smoke identifications.
- d. Adequate security
- e. Programming
  - (1) Determine what is to be moved.
  - (2) Determine priority for movement.
  - (3) Prepare manifest
  - (4) 8000# max
  - (5) Prepare loading plan in several copies
  - (6) Designate ground movement commander.
  - (7) Check all loads
  - (8) Gunship support
  - (9) Alternate plan (wx)
- f. Internal vs. external loading (Encourage external loading.)

7. Tips for the Hook-up Man.

- a. Goggles
- b. Static Electricity
- c. Slings pull on long axis of clevis
- d. Clear load ASAP after hook
- e. Don't close your eyes or turn your back.

8. Principles of Rigging

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Appendix 10 continued (Suggested Outline for MTT Class) to Annex  
(Operations SOP CH-47) to 222nd Combat Support Aviation Battalion SOP

- a. Nylon characteristics
  - b. Care of sling equipment
  - c. Determining sling length
  - d. Description of equipment
    - (a) Clevis & shackle
    - (b) Doughnut
    - (c) Slings - Liners
    - (d) Nets
    - (e) Forest Penetrator
    - (f) A-22 Bag
    - (g) 4-legged Sling
  - e. Rigging Demonstration
    - (a) 1/2T & 3/4T internal & external (Encourage external rigging for 3/4 ton vehicles)
    - (b) Water Trailer
    - (c) 105mm Howitzer & Piggyback
    - (d) Lumber or bulk loads.
9. Review, Critique (Furnish FSNS of all rigging equipment)

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Appendix 11 (CH-47 A&B 90 Day Standardization Checklist) to Annex  
(Operational SOI CH-47) to 222nd Combat Support Aviation Battalion

CH-47A & B 90 DAY STANDARDIZATION CHECKLIST

| NAME                              | RANK | SN | SAT | UNSAT |
|-----------------------------------|------|----|-----|-------|
| 1. Flight Planning                |      |    |     |       |
| 2. Preflight Procedure            |      |    |     |       |
| 3. Starting Procedure             |      |    |     |       |
| 4. Normal Takeoff                 |      |    |     |       |
| 5. Normal Landing                 |      |    |     |       |
| 6. Max Perform Takeoff            |      |    |     |       |
| 7. Steep Approach                 |      |    |     |       |
| 8. Slope Operations               |      |    |     |       |
| 9. Internal - External Operations |      |    |     |       |
| 10. Autorotation (Power Recovery) |      |    |     |       |
| 11. Beep Failure                  |      |    |     |       |
| 12. Hydraulic Failure             |      |    |     |       |
| 13. Electrical System Failure     |      |    |     |       |
| 14. Fuel System Failure           |      |    |     |       |
| 15. Speed Trim Failure            |      |    |     |       |
| 16. SAS Failure                   |      |    |     |       |
| 17. Single Engine Operations      |      |    |     |       |
| 18. Air Restart - Single Engine   |      |    |     |       |
| 19. Engine Fire - Ground & Air    |      |    |     |       |
| 20. DECCA Operations              |      |    |     |       |
| 21. Transponder Operations        |      |    |     |       |
| 22. SOI                           |      |    |     |       |
| 23. Flight Following              |      |    |     |       |
| 24. Artillery Advisory            |      |    |     |       |
| 25. Basic Instrument Maneuvers    |      |    |     |       |
| 26. Radio Navigation              |      |    |     |       |
| 27. GCA Approach                  |      |    |     |       |
| 28. Shutdown Procedure            |      |    |     |       |
| 29. Rules of Engagement (Oral)    |      |    |     |       |

Aviator successfully completed 90 day Standardization Check  
on \_\_\_\_\_ and is fully operational to perform duties as  
Aircraft Cmdr-Pilot-Co-Pilot.

\_\_\_\_\_  
Instructor Pilot

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ITEM 3

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ITEM 4

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